SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1965

No. 73

UNITED STATES, Appellant,

vs.

GRINNELL CORPORATION, ET AL.

No. 74

GRINNELL CORPORATION, Appellant,

vs.

UNITED STATES

No. 75

AMERICAN DISTRICT TELEGRAPH COMPANY, Appellant,

vs.

UNITED STATES

No. 76

HOLMES ELECTRIC PROTECTIVE COMPANY, Appellant,

vs.

UNITED STATES

No. 77

AUTOMATIC FIRE ALARM COMPANY OF DELAWARE, Appellant,

vs.

UNITED STATES

APPEALS FROM THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF RHODE ISLAND

Exhibit Volume I

INDEX

Record from the United States District Court for the District of Rhode Island—Continued

GOVERNMENT'S EXHIBITS

	Original	Print
No. 1—NBFU No. 71, Standard of the National Board of Fire Underwriters for the Installation, Maintenance and Use of Central Station Protective Signaling Systems for Watchman, Fire Alarm and Supervisory Service as recommended by the National Fire Protection Association, July, 1958 and July, 1959 Amendments	1351	789
No. 2—NBFU No. 72—Standard of the National Board of Fire Underwriters for the Installation, Maintenance and Use of Proprietary, Auxiliary, Remote Station, and Local Protective Signaling Systems, July, 1958	1375	813
No. 3—Underwriters Laboratories, Inc. (UL 611), Standards for Safety, Central Station Burglar Alarm Systems, December, 1956	1405	843
No. 4—Underwriters Laboratories, Inc., Accident, Automotive, and Burglary Protection Equipment Lists, September, 1961	1439	877
No. 5—Manual of Burglary Insurance, Pages 212-215; 333-336; 417 and 418	1574	1012
No. 6—Approved Equipment for Industrial Fire Protection, 1962-1963, Associated Factory Mutual Fire Insurance Companies	1584	1022
Exhibit Volume II		
No. 7—Introductory letter from ADT General Commercial Manager, A. E. Smith to Commercial Superintendents and Representatives, dated March 30, 1953 transmitting proposed ADT Sales Manual, "Selling ADT Service" (excerpts)	1742	1179
No. 9—Agreement dated March 1, 1907 between ADT and the Brooklyn Telegraph and Messenger Company, Brooklyn, New York (excerpts)	1753	1187
No. 10—ADT acquisition agreement of the Merchants Fire & Dispatch Company, Los Angeles, California, dated August 1, 1907 (excerpts)	1763	1189
No. 11—ADT acquisition agreement of the Bankers' Electric Protective Company and American Bank Protection Company, dated June 27, 1908	1769	1191
No. 12—ADT acquisition agreement of the Pinkerton National Detective Agency and Pinkerton's Protective Patrol, dated February 21, 1908 (excerpts)	1772	1194

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 13—ADT acquisition agreement of The Still Alarm Company, dated September 6, 1913 (excerpts)	1777	1195
No. 14—ADT acquisition agreement of the Manhattan Fire Alarm Company, dated April 9, 1917 (excerpts)	1783	1196
No. 15—ADT acquisition agreement of The Still Alarm Company, dated November 27, 1918 (excerpts)	1787	1198
No. 16—ADT acquisition agreement of the Pacific Messenger Company, dated September 9, 1926 (excerpts)	1789	1199
No. 17—ADT acquisition agreement of the American Still Alarm of Detroit, dated September 29, 1926 (excerpts)	1793	1200
No. 18—ADT acquisition agreement of the Baltimore National Automatic Fire Alarm Company of Baltimore City, dated April 26, 1928 (excerpts)	1798	1202
No. 19—ADT acquisition agreement of the Spokane Alarm Company of Spokane, Washington, dated August 30, 1928 (excerpts)	1808	1203
No. 20—ADT acquisition agreement of the Reliance Electric Protective Company, Chicago, Illinois, dated November 16, 1931 (excerpts)	1809	1204
No. 21—ADT acquisition agreement of the Los Fire Alarm Company, Los Angeles, California, dated January 13, 1933 (excerpts)	1810	1205
No. 22—ADT acquisition agreement of the Lewis Signal and Alarm Corporation, Sioux City, Iowa, dated August 8, 1934 (excerpts)	1811	1206
No. 23—ADT acquisition agreement of the Signal Protective Service Company, St. Louis, Missouri, dated February 8, 1935 (excerpts)	1816	1208
No. 24—ADT acquisition agreement of the Automatic Alarms, Ltd., Los Angeles, California, dated July 15, 1936 (excerpts)	1824	1209
No. 25—ADT acquisition agreement of the Los Angeles Central Station, Inc., Los Angeles, California, dated May 20, 1938 (excerpts)	1829	1210
No. 26-1—ADT acquisition agreement of the Reliance Alarm Company, (R. Houghton) Detroit, Michigan, dated August 9, 1946	1835	1211
26-2—ADT acquisition agreement of the Reliance Alarm Company, (Peter Bens) Detroit, Michigan, dated August 9, 1946	1837	1213

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
26-3—Schedule Showing Computation of Purchase Price	1839	1216
No. 27—ADT acquisition agreement of the American District Telegraph Company of Hamilton County, Ohio, dated October 28, 1946 (excerpts)	1840	1217
No. 28-1—ADT acquisition agreement of the Ludlow Automatic Fire Alarm Company, Cincinnati, Ohio, dated October 28, 1946 (excerpts)	1847	1220
28-2—Memorandum for J. A. MacDonald, Auditor Re: Purchase of Ludlow Companies, Cincinnati, Ohio, dated December 2, 1946 (excerpts)	1854	1223
No. 29—ADT acquisition agreement of the Crown Burglar Alarm Systems, Pasadena, California, dated May 13, 1954 (excerpts)	1857	1224
No. 30-1—ADT acquisition agreement of the Globe Electric Protection Company, Ocean City, New Jersey, dated June 8, 1954	1863	1227
30-2—Letter from Ray Brechbill to Harold H. Gray, Globe Electric Protective, dated June 15, 1954 re amendments to agreement	1866	1231
No. 31—ADT acquisition agreement of the General Alarm Corporation, Boston, Massachusetts, dated March 9, 1955 (excerpts)	1867	1232
No. 32—ADT acquisition agreement of the Federal Automatic Alarm Co., Inc., Albuquerque, New Mexico, dated June 10, 1959 (excerpts)	1869	1233
No. 37—Holmes acquisition agreement of the Mercantile Burglar Alarm Company, New York, New York, dated December 15, 1925 (excerpts)	1873	1236
No. 38—Holmes acquisition agreement of the Metropolitan Electric Protective Company, New York, New York, dated August 3, 1928 (excerpts)	1875	1237
No. 39—Holmes acquisition agreement of the Silent Electric Protective Corporation, New York, New York, dated December 14, 1928 (excerpts)	1889	1249
No. 40—ADT acquisition agreement of the Los Angeles Central Station, Inc., Los Angeles, California, dated May 20, 1938 (excerpts)	1893	1251
No. 41—Memorandum from ADT President E. Ward to ADT Vice President J. A. MacDonald, captioned, Lewis System-Sioux City, Iowa, dated November 19, 1951	1901	1254

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 42—ADT acquisition agreement of the property interest of Automatic Fire Protection Company in the 1907 allocation agreements, dated January 1, 1949 (excerpts)	1902	1255
No. 43—Memorandum by ADT Vice President A. E. Smith reporting on Meeting with owners of Central Watch Service (Stackler), Chicago, Illinois, dated February 10, 1960 (excerpts)	1917	1267
No. 44—Memorandum from ADT Assistant to General Sales Manager L. B. Straus to ADT General Sales Manager L. J. O'Brien, captioned, Tulsa, Oklahoma, dated April 14, 1960	1922	1270
No. 45—Memorandum from ADT Vice President A. E. Smith to ADT President E. Gaston, dated April 7, 1960	1923	1271
No. 46—Memorandum by ADT Vice President A. E. Smith captioned, Report on Tampa Signal Co., Inc., (Florida Corporation) dated March 22, 1960	1929	1275
No. 47—Memorandum from ADT Vice President A. E. Smith to ADT Vice President J. A. MacDonald, captioned, Tampa Signal Company, Inc., dated August 31, 1960	1936	1281
No. 48—Memorandum from ADT District Sales Manager E. O. Betscher to ADT General Sales Manager L. J. O'Brien, captioned, Tampa, Florida, dated March 20, 1961	1938	1282
No. 49—Memorandum from ADT Vice President A. E. Smith to President E. Gaston, captioned Tampa Signal Company, Inc., dated March 23, 1960	1940	1283
No. 50—Letter from ADT President E. Gaston to President H. G. Clark of the Rhode Island Electric Protective Company, dated October 1, 1958	1942	1284
No. 51—Letter from President H. G. Clark of Rhode Island Electric Protective Company to ADT President E. Gaston, dated July 8, 1955	1944	1286
No. 52—Letter from ADT President E. Gaston to President H. G. Clark of the Rhode Island Electric Protective Co., dated June 16, 1955	1945	1287
No. 53—Memorandum from ADT President E. Gaston to First Vice President J. A. MacDonald, captioned, Rhode Island Electric Protective Company, dated July 28, 1958	1946	1288
No. 54—Letter from Holmes President H. C. Ward to The Stockholders of Newark District Telegraph Company, dated July 7, 1960	1948	1290

	Original	Print
Record from the United States District Court for the District of Rhode Island—Continued		
GOVERNMENT'S EXHIBITS—Continued		
No. 55—Unsigned handwritten notes entitled "Board of Directors Meeting, February 20, 1958", obtained from the files of Holmes	1955	1295
No. 56—Letter from AFA President T. P. Drew to Grinnell President J. D. Fleming, dated May 29, 1956	1959	1296
No. 57—Letter from AFA President T. D. Drew to Central Station Signals, Inc., dated February 16, 1959	1962	1299
No. 58—Memorandum for File by ADT President E. Gaston, captioned, Central Station Signals, Inc., New York, N.Y., dated May 22, 1959	1967	1303
No. 59—Memorandum from ADT President E. Gaston, entitled, Appendix to President's Report for Meeting of November 19, 1959, dated November 13, 1959	1969	1305
No. 60—Letter agreement from AFA to The Stockholders of Central Station Signals, Inc., dated December, 1960	1971	1306
No. 61—Agreement between ADT and Holmes, dated September 28, 1906	1979	1312
No. 62—Agreement between ADT and Holmes, dated March 26, 1918	1983	1315
No. 63—Agreement between ADT and Holmes, dated June 14, 1922	1992	1322
No. 64—Agreement between ADT and Holmes, dated March 3, 1927	2000	1329
No. 65—Letter from Holmes President A. W. Allen to ADT President C. C. Johnson, dated June 13, 1932	2005	1335
No. 66—Letter from "President" to Holmes President A. W. Allen, dated July 8, 1932	2006	1336
No. 67—Letter from ADT Vice President C. C. Johnson to Holmes President H. S. Stevens, dated January 31, 1924	2007	1337
No. 68—Letter from Holmes President H. S. Stevens to ADT Vice President C. C. Johnson, dated February 4, 1924	2008	1338
No. 69—Agreement between ADT and Holmes, dated March 25, 1930	2009	1338
No. 70—Letter from ADT Sales Representative J. A. Summers to Holmes Vice President W. F. Burress, dated June 11, 1956	2012	1341
No. 71—Memorandum from ADT District Sales Manager E. J. Heisley to General Sales Manager L. J. O'Brien, captioned Gerard Trust Company, Philadelphia Area, dated March 31, 1959	2014	1343

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 72—Letter from ADT President C. C. Johnson to Holmes President A. W. Allen, dated June 16, 1930	2016	1345
No. 73—Letter from ADT General Commercial Manager A. E. Smith to ADT Commercial Superintendent D. R. Hall, captioned, Ford Motor Company, Parts Warehouse, Pittsburgh, Pa., dated May 12, 1953	2018	1346
No. 74—Letter from ADT Sales Representative E. C. Dowling to Jay Misicka, American-Marietta Company, Chicago, Illinois, dated May 10, 1961	2019	1348
No. 75—Letter from Holmes "President" to ADT President C. C. Johnson, dated June 28, 1939	2021	1350
No. 76—Letter from ADT President C. C. Johnson to Holmes President A. W. Allen, dated July 11, 1939	2022	1351
No. 77—Letter from ADT Special Representative H. E. May to L. E. Burke, Sears, Roebuck and Company, Philadelphia, Pennsylvania, dated October 31, 1957	2023	1352
No. 78—Agreement dated February 18, 1904 between Robert L. McElroy and ADT	2024	1353
No. 79—Agreement dated April 21, 1905 between Robert L. McElroy and Automatic Fire Protection Company	2034	1361
No. 80A, B, C—Three Agreements dated April 29, 1907 between Grinnell, ADT, AFA and the Automatic Fire Protection Company	2036	1362
No. 81—Agreement dated June 13, 1913 between ADT, Automatic Fire Protection Company and Fire Protection Development Company	2067	1387
No. 82—Letter agreement between ADT and General Fire Extinguisher Company (Grinnell) dated June 2, 1932	2078	1396
No. 83—Letter agreement between ADT and General Fire Extinguisher Company (Grinnell) dated June 2, 1939	2079	1397
No. 84—Agreement dated February 18, 1954 between ADT and AFA	2080	1398
No. 85—Memorandum for File, by ADT Vice President J. A. MacDonald, captioned, Grinnell Corporation Negotiation, dated October 8, 1951	2085	1402
No. 86—Memorandum from Grinnell Counsel R. T. Clapp to Grinnell President J. D. Fleming, captioned, ADT Matter, dated November 15, 1951	2096	1421

	Original	Print
Record from the United States District Court for the District of Rhode Island—Continued		
GOVERNMENT'S EXHIBITS—Continued		
No. 87—Memorandum from Grinnell Counsel R. T. Clapp to Grinnell President J. D. Fleming, captioned, ADT Matter, dated January 5, 1952	2100	1425
No. 88—Memorandum of Grinnell Secretary and Counsel R. T. Clapp entitled, Memorandum of Conference at Mr. Ward's Office, American District Telegraph Company, June 9, 1948, dated June 11, 1948	2105	1430
No. 89—Agreement dated December 29, 1952, between ADT and Grinnell	2108	1434
No. 92—Letter from ADT President E. Gaston to Grinnell Treasurer C. H. Rison dated June 19, 1959	2148	1471
No. 93—Letter from ADT President E. Gaston to AFA President T. P. Drew dated January 13, 1959	2150	1473
No. 94—Letter from AFA President T. P. Drew to Grinnell President J. D. Fleming dated February 13, 1959	2160	1483
No. 95—Letter from ADT President E. Gaston to Grinnell President J. D. Fleming dated February 6, 1959	2163	1486
No. 96—Memorandum from ADT Controller C. G. Eicker to Vice President J. A. MacDonald, captioned—Rate Development—dated June 29, 1956	2165	1487
No. 97—Letter from AFA Sales Manager J. J. Heavey to Davis, Dorland & Co., New York, N.Y., dated October 5, 1956	2191	1518
No. 98—Letter from ADT Auditor J. A. MacDonald to AFA President T. P. Drew, captioned—Solicitation of Industrial Process Service in Conjunction with Sales of S.S. & W.F. Service—dated June 10, 1948	2192	1519
No. 104—Letter from ADT Assistant Secretary E. A. Gaston to AFA President T. P. Drew, captioned—Albert H. Voight, Inc., Philadelphia, Pa.—dated July 7, 1961	2194	1521
No. 107—Letter from Grinnell Secretary R. T. Clapp to AFA President T. P. Drew dated May 15, 1959	2195	1522
No. 111—Agreement dated December 24, 1953 between ADT, AFA and Grinnell	2196	1523
No. 112—Letter from T. P. Drew, President of AFA to F. J. Lehner, L. W. Thomason, F. Durward Chase and A. G. Seddon, dated December 21, 1954 re transmittal of Letter Agreement dated December 15, 1954 between ADT, AFA and Grinnell	2200	1525

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 128—Agreement dated March 29, 1954 between ADT, Grinnell and the Rhode Island Electric Protective Company	2205	1528
No. 129—Agreement dated March 29, 1954 between ADT and the Rhode Island Electric Protective Company	2212	1534
No. 130—Memorandum from ADT Vice President J. A. MacDonald to ADT Secretary John Hannon dated December 10, 1953	2218	1540
No. 131—Letter from ADT Vice President A. E. Smith to President H. G. Clark of the Rhode Island Electric Protective Company dated December 11, 1958	2220	1542
No. 132—Letter from Rhode Island Electric Protective Company President H. G. Clark to ADT, dated February 5, 1963	2221	1543
No. 133—Letter from Rhode Island Electric Protective Company President H. G. Clark to Grinnell, dated January 19, 1961	2223	1545
No. 139—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Sales Manager L. J. O'Brien, captioned, Competition-Washington District, dated September 14, 1956	2224	1546
No. 140—Memorandum from ADT Superintendent of Field Service R. T. Warner to ADT General Commercial Manager A. E. Smith, captioned, Competition-Milwaukee, dated May 19, 1953	2227	1549
No. 141—Memorandum from ADT District Sales Manager W. K. Francis to ADT General Sales Manager L. J. O'Brien, captioned, Competition-Paramount Pictures Corporation, Los Angeles, California, dated August 10, 1956	2229	1550
No. 142—Memorandum from ADT District Sales Manager W. K. Francis to ADT General Sales Manager L. J. O'Brien, captioned, Paramount Pictures Corporation, Los Angeles, California, dated May 9, 1957	2230	1552
No. 143—Memorandum from ADT Assistant to General Sales Manager W. W. Dooley entitled, Report on Survey of Sales Potential, San Jose Peninsula, (Not dated)	2232	1554
No. 144—Memorandum from ADT District Managers to ADT General Managers, captioned, Competition-Peoria, Illinois, dated December 12, 1955	2235	1556

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 145—Handwritten confidential memoranda from ADT Representative W. Rohlfing captioned Call's Police Signal, Chelsea, Massachusetts, dated July 16, 1956	2238	1559
No. 146—Memorandum from ADT District Sales Manager R. T. Warner to ADT Vice President A. E. Smith, captioned, Call's Police Signal Corporation, Chelsea, Mass., dated September 24, 1956	2242	1561
No. 147—Memorandum (unsigned) to ADT District Sales Manager E. Turnbull, captioned, Competition; Merchants Police, Milwaukee, Wisconsin, dated July 30, 1955	2243	1562
No. 148—Memorandum from ADT Sales Representative R. P. Lucy to ADT District Sales Manager W. K. Francis, captioned Competition-Bay Burglar Alarm Company, dated March 28, 1958	2245	1564
No. 149—Memorandum from ADT District Sales Manager W. K. Francis to ADT Commercial Superintendent E. B. White, captioned General Plant Protection Company, Los Angeles, California, dated May 15, 1952	2246	1565
No. 150—Memorandum from ADT District Managers to ADT General Managers, captioned Proposed Central Station-Anaheim (Orange County) California, dated July 26, 1960	2247	1567
No. 151—Memorandum from ADT General Superintendent, Operating Department to ADT Vice President J. A. MacDonald, captioned, Proposed Central Station, San Jose, California, dated March 24, 1959	2250	1570
No. 152—Memorandum from ADT General Superintendent of Plant W. Hable to ADT General Sales Manager L. J. O'Brien, captioned, Proposed Central Station-San Jose, California, dated March 20, 1959	2251	1571
No. 153—Memorandum from ADT District Managers to ADT General Managers, captioned Proposed Central Station-San Diego, California, dated March 4, 1959	2252	1572
No. 154—Memorandum from ADT Vice President A. E. Smith to ADT Vice President J. A. MacDonald dated August 3, 1960	2254	1575

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 155—Memorandum from ADT President E. Gaston to ADT Vice President J. A. MacDonald, captioned, Proposed New Central Station-San Fernando Valley-Los Angeles, California, dated July 12, 1961	2256	1576
No. 156—Memorandum from ADT Vice President A. E. Smith to ADT Vice President J.A. MacDonald, captioned Proposed New Central Station, Huntington Park, Los Angeles, dated June 3, 1952	2258	1578
No. 157—Memorandum from ADT District Managers to ADT General Managers, captioned Proposed Central Station, New Brunswick, New Jersey, dated July 13, 1959 (excerpts)	2261	1581
No. 158—Memorandum from ADT Executive Account Representative F. J. Concannon to ADT General Sales Manager L. J. O'Brien, captioned, New Central Station, Nassau County, Long Island City, N.Y., dated August 17, 1955	2264	1583
No. 159—Memorandum from ADT Vice President J. A. MacDonald to ADT General Commercial Manager A. E. Smith, captioned, Possible Establishment of Central Station at Jamaica, Long Island, dated April 14, 1952	2267	1585
No. 160—Memorandum from ADT District Managers to ADT General Managers, captioned, Proposed New Central Station, San Fernando Valley, dated July 26, 1960	2268	1587
No. 161—Memorandum from ADT District Plant Superintendent J. F. Burns to W. Hable, captioned, Proposed sub-divisions of existing Central Stations-New York District, dated December 2, 1958	2271	1592
No. 163—Memorandum from ADT Director of Diversification & Expansion J. J. Stephens to ADT Vice President A. E. Smith, captioned, Sales Potential, Westchester County, New York, dated December 20, 1957	2274	1594
No. 164—Memorandum from ADT Vice President to ADT President Gaston, captioned, Charlotte, North Carolina, dated July 6, 1960	2279	1599
No. 167—Memorandum from ADT First Vice President J. A. MacDonald to ADT Controller C. G. Eicker, captioned, Rate Development, dated July 12, 1956	2282	1602
No. 168—Memorandum by ADT Vice President J. A. MacDonald, captioned, Rate Adjustment 1959, dated November 10, 1959	2284	1605

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 169—Memorandum from ADT First Vice President J. A. MacDonald to ADT Vice President A. E. Smith, captioned, Minimum Basic Annual Service Charges, dated December 22, 1959	2286	1608
No. 170—Memorandum from ADT President E. Gaston to ADT First Vice President J. A. MacDonald, captioned Rate Development, dated July 11, 1956	2289	1611
No. 171—Memorandum by Holmes President H. C. Ward, entitled, Holmes Electric Protective Company of Philadelphia, Proposed 1957 Electric Protective Service Rate Revision, dated February 18, 1957 (excerpts)	2291	1612
No. 172—Memorandum by Holmes President H. C. Ward, entitled, Revision of Electric Protective Service Rates Proposed for Adoption for Mercantile and Residence Services, May 1, 1953, and for Financial Institution Service June 1, 1953, dated February 25, 1953	2296	1617
No. 173—Memorandum for File (unsigned) captioned, Projected Cash Resources and their Application, Five year Period ending December 31, 1963	2297	1619
No. 174—Memorandum from ADT District Sales Manager E. Turnbull to ADT General Sales Manager L. J. O'Brien, captioned Sales Production-Integrity of Service Charges, dated September 17, 1957	2302	1626
Exhibit Volume III		
No. 175—Contract Data Reports and Competition Reports for Albany, New York (excerpts)	2304	1629
No. 176—Contract Data Reports for Atlanta, Georgia (excerpts)	2316	1635
No. 177—Contract Data Reports and Competition Reports for Boston, Massachusetts (excerpts)	2323	1642
No. 178—Contract Data Reports for Buffalo, New York (excerpts)	2350	1665
No. 179—Contract Data Reports and Competition Reports for Chicago, Illinois (excerpts)	2368	1677
No. 180—Contract Data Reports and Competition Reports for Cincinnati, Ohio (excerpts)	2398	1700
No. 181—Contract Data Reports and Competition Reports for Cleveland, Ohio (excerpts)	2418	1716

	Original	Print
Record from the United States District Court for the District of Rhode Island—Continued		
GOVERNMENT'S EXHIBITS—Continued		
No. 182—Contract Data Reports and Competition Reports for Dallas, Texas (excerpts)	2445	1738
No. 183—Contract Data Reports and Competition Reports for Dayton, Ohio (excerpts)	2470	1755
No. 184—Contract Data Reports and Competition Reports for Denver, Colorado (excerpts)	2486	1766
No. 185—Contract Data Reports and Competition Reports for Detroit, Michigan (excerpts)	2500	1780
No. 186—Contract Data Reports and Competition Reports for Houston, Texas (excerpts)	2515	1790
No. 187—Contract Data Reports and Competition Reports for Indianapolis, Indiana (excerpts)	2527	1801
No. 188—Contract Data Reports and Competition Reports for Los Angeles, California (excerpts)	2551	1813
No. 189—Contract Data Reports for Louisville, Kentucky (excerpts)	2566	1823
No. 190—Contract Data Reports for Memphis, Tennessee (excerpts)	2576	1831
No. 191—Contract Data Reports and Competition Reports for Milwaukee, Wisconsin (excerpts)	2589	1839
No. 192—Contract Data Reports and Competition Reports for Minneapolis, Minnesota (excerpts)	2619	1855
No. 193—Contract Data Reports and Competition Reports for Newark, New Jersey (excerpts)	2632	1864
No. 194—Contract Data Reports for New Orleans, Louisiana (excerpts)	2644	1872
No. 195—Contract Data Reports and Competition Reports for New York, New York (excerpts)	2653	1879
No. 196—Contract Data Reports for Omaha, Nebraska (excerpts)	2670	1895
No. 197—Contract Data Reports and Competition Reports for Peoria, Illinois (excerpts)	2678	1901
No. 198—Contract Data Reports and Competition Reports for Philadelphia, Pennsylvania (excerpts)	2686	1906
No. 199—Contract Data Reports for Portland, Oregon (excerpts)	2696	1915
No. 200—Contract Data Reports and Competition Reports for San Francisco, California (excerpts)	2704	1922
No. 201—Contract Data Reports for Seattle, Washington (excerpts)	2710	1928
No. 202—Contract Data Reports and Competition Reports for St. Louis, Missouri (excerpts)	2720	1935
No. 203—Contract Data Reports and Competition Reports for Washington, D. C. (excerpts)	2731	1945

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 206—Report on ADT General Sales Meeting April 6, 7 and 8, 1955, at the New York Athletic Club	2748	1961
No. 208—Memorandum from ADT Vice President to ADT President E. Gaston, captioned, Service Charges—Proposed Revision, dated November 24, 1954	2778	2003
No. 209—Memorandum for File by ADT Vice President J. A. MacDonald, captioned, Rate Development, dated November 17, 1955	2780	2006
No. 210—Memorandum for File by ADT Vice President, J. A. MacDonald, captioned, Rate Adjustments 1959, dated November 10, 1959	2784	2012
No. 212—Directive issued by ADT Vice President A. E. Smith and Concurred in by ADT President E. Gaston to ADT District Sales Managers, captioned, Delegation of Authority, with Supplement, issued on July 1, 1960	2785	2013
No. 213—Memorandum from ADT President E. Gaston to ADT General Sales Manager L. J. O'Brien, captioned R. H. Macy, Paramus, N. J., dated December 29, 1955	2791	2020
No. 214—Memorandum from ADT Sales Representative D. M. Gates to ADT Executive Accounts Representative Alex Gaston, captioned, McAlpin Company, Cincinnati, Ohio, dated April 25, 1958	2792	2021
No. 215—Memorandum from ADT Commercial Superintendent J. B. Bodley to ADT General Sales Manager A. E. Smith, captioned, Federal Engineering Co., Inc., Washington, D. C., dated November 14, 1952	2793	2022
No. 216—Memorandum from ADT General Sales Manager L. J. O'Brien to ADT District Sales Manager W. J. Robinson, captioned, Competition, Fidelity Electronics Protective Service, Pittsburgh, Pensylvania, dated March 14, 1961	2794	2023
No. 217—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Sales Manager L. J. O'Brien, captioned, National Protective Corporation, Baltimore, Maryland, dated October 27, 1960	2795	2024
No. 218—Memorandum from ADT District Sales Manager E. Turnbull to ADT General Sales Manager L. J. O'Brien, captioned, Competition—Autocall and Automatic Alarm, Minneapolis, Minnesota, dated March 13, 1959	2796	2025

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 219—Memorandum from ADT District Sales Manager J. D. Patton to ADT General Sales Manager L. J. O'Brien, captioned, Competition—Fort Worth, dated December 22, 1958	2799	2028
No. 220—Memorandum from ADT Sales Representative R. W. Rice to ADT District Sales Manager J. D. Patton, captioned, New District Account—Letellier-Phillips Paper Co., New Orleans, La., dated January 14, 1960	2800	2029
No. 221—Memorandum from ADT District Sales Manager E. J. Heisley to ADT Sales Representative L. F. Lytle, captioned, Reliable Stores Corp., Washington, D. C., dated November 22, 1960	2802	2031
No. 222—Comparative Summary of Percentages of Minimum Basic Charges Secured at each ADT central station in the United States for the years 1957 through 1961	2804	2033
No. 223—Memorandum from ADT District Sales Manager A. S. Jacks to ADT General Sales Manager L. J. O'Brien, captioned, Competition—Dayton, Ohio, Liberal Markets, Inc., dated August 8, 1961	2811	2039
No. 224—Memorandum from ADT Commercial Superintendent J. B. Bodley to ADT General Commercial Manager A. E. Smith, captioned, Federal Engineering Co., Washington, D. C., dated June 9, 1953	2813	2041
No. 225—Memorandum from ADT General Sales Manager L. J. O'Brien to ADT District Sales Manager J. K. Scott, captioned, York Professional Pharmacy, Los Angeles, California, dated July 15, 1960	2814	2042
No. 227—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Sales Manager L. J. O'Brien, captioned, Competition (rumored) Philadelphia, Pennsylvania, dated October 22, 1957	2815	2043
No. 228—ADT central station protection service Contract Forms for Watchman's Reporting and Manual Fire Alarm Service, Automatic Fire Alarm Service, Sprinkler Supervisory and Waterflow Alarm Service and Burglary and Holdup Protection Service	2818	2047
No. 229—Memorandum from ADT District Sales Manager C. L. Chafee to ADT Vice President A. E. Smith, captioned, Regional Sales Conferences and District Sales Meeting 1955, dated February 18, 1955	2822	2055

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 230—Memorandum from ADT Controller C. G. Eicker to ADT First Vice President J. A. MacDonald, captioned, Tampa, Florida, dated September 11, 1961	2823	2057
No. 231—Memorandum from ADT Vice President J. A. MacDonald to ADT Controller C. G. Eicker, captioned, Advance Service Charge for Sprinkler Supervisory and Waterflow Alarm Services, dated August 5, 1953	2828	2063
No. 232—Memorandum (unsigned) entitled, Charges Proposed by Commercial Department for all types of Sprinkler Supervisory and Waterflow Alarm Service and Waterflow Only Service (not dated)	2829	2064
No. 233—Memorandum from ADT Controller C. G. Eicker to ADT First Vice President J. A. MacDonald, captioned, Rate Development, dated July 18, 1958	2833	2069
No. 234—Memorandum from ADT Controller C. G. Eicker to ADT First Vice President J. A. MacDonald, captioned, Rate Development, dated August 30, 1956	2835	2070
No. 235—ADT Tabulation (unsigned) entitled, Proposed Revision in Advance Service Charges 8/28/56	2837	2074
No. 236—Annual Report of the Holmes Electric Protective Company and Subsidiaries for the year 1960 (excerpts)	2840	2075
No. 237—Memorandum from ADT Commercial Superintendent E. O. Betscher to ADT General Commercial Manager A. E. Smith, dated May 25, 1951	2845	2076
No. 238—Memorandum from ADT President E. Gaston to ADT General Sales Manager R. Brechbill, captioned, Owl Protective Company, Long Island City, N.Y., dated November 7, 1962	2847	2079
No. 239—Memorandum for File by ADT Vice President AES, captioned, Competition, Call's Police Signal Co., Chelsea, Massachusetts, dated July 26, 1956	2848	2080
No. 240—Memorandum from ADT General Sales Manager L. J. O'Brien to ADT District Sales Manager A. S. Jacks, captioned, Competition, Buffalo, New York, dated September 8, 1959	2850	2082

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 241—Memorandum from ADT District Sales Manager R. T. Warner to ADT General Sales Manager L. J. O'Brien, captioned, Cole-Hersee Company, South Boston, Massachusetts, dated September 29, 1958	2851	2082
No. 242—Memorandum from ADT Sales Representative G. V. Roach to ADT Assistant to General Sales Manager R. Brechbill, captioned, Quality Wool Quilting Corp., Astoria, New York, dated August 8, 1961	2853	2084
No. 243—Memorandum from ADT District Sales Manager E. J. Heisley to ADT Special Representative H. E. May, captioned, Bellevue Stratford Hotel and Benjamin Franklin Hotel, Philadelphia, Pa., dated September 23, 1960	2854	2085
No. 244—Memorandum from ADT Sales Representative R. F. Michiel, Sr., to ADT District Sales Manager E. Turnbull, captioned, Request for Competitive Quotation to Secure Agreement for SS & WFA with a new Subscriber, Milwaukee Forge and Machine Company, dated July 2, 1959	2855	2086
No. 245—Memorandum from ADT District Sales Manager R. T. Warner to ADT General Sales Manager L. J. O'Brien, captioned, Raymond's, Inc., South Boston, Mass., dated August 9, 1958	2857	2088
No. 246—Memorandum from AFA Commercial Representative J. J. Way to AFA Vice President L. W. Thomason, captioned, Morris Fishman & Sons, Inc., Philadelphia, Pa., dated November 13, 1957	2859	2090
No. 247—Memorandum from ADT Special Representative F. E. Miller to ADT District Sales Manager E. Turnbull, captioned, Continental Can Company, Milwaukee, Wisconsin, dated March 20, 1959	2860	2091
No. 248—Memorandum from ADT Sales Representative A. A. Balestrino to ADT District Sales Manager A. S. Jacks, captioned, Hyde Park Lumber Co., Cincinnati, Ohio, dated July 28, 1960	2862	2092
No. 250—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Manager L. J. O'Brien, captioned, Nationwide Safti Brake Co., Falls Church, Virginia, dated April 17, 1959	2863	2094
No. 251—Memorandum from ADT Sales Representative C. J. Lawson to ADT District Sales Manager D. R. Hall, dated January 14, 1958	2865	2096

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 252—Memorandum from ADT First Vice President J. A. MacDonald to ADT President E. Gaston, captioned, Malcolm Goldstone, Owl Protective Co., dated February 9, 1962	2866	2097
No. 253—Memorandum from ADT District Sales Manager J. K. Swanson to ADT General Sales Manager L. J. O'Brien, captioned, Wright-Bachman, Inc., Indianapolis, Indiana, dated September 11, 1961	2869	2099
No. 254—Memorandum from ADT Sales Representative W. J. King to ADT Special Representative H. E. May, captioned, Philco Distributors, Inc., Milwaukee, Wisconsin, dated February 18, 1960	2870	2100
No. 255—Memorandum from ADT Sales Representative B. W. Henke to ADT Executive Accounts Representative F. J. Concannon, captioned, American Brass Company, Cleveland, Ohio, dated April 19, 1956	2872	2101
No. 256—ADT General Instructions No. 77, entitled, Contract Procedures, issued July 11, 1960	2874	2103
No. 257—Memorandum from ADT Special Representative J. R. Norris to ADT Commercial Superintendent C. L. Chafee, captioned, National Can Corp., Cleveland, Ohio, dated July 23, 1954	2878	2110
No. 258—Memorandum from ADT Sales Representative S. J. Sievers to ADT Executive Accounts Representative H. Schultz, captioned, Foley's, Houston, Texas, dated September 22, 1960	2879	2112
No. 259—Memorandum from ADT Sales Representative J. P. Dunn to ADT National Accounts Representative F. J. Concannon, captioned, Johns-Manville Corp., Los Angeles, California, dated June 18, 1958	2880	2113
No. 260—Letter from A. F. Greenwood of Government Employees Exchange, Inc., to D. R. White, Albany Protective Service, Albany, New York, dated August 7, 1961	2881	2114
Exhibit Volume IV		
No. 261—Memorandum from ADT Manager, Field Service Division, R. Brechbill to ADT General Manager of Sales Production L. J. O'Brien, captioned, Procter & Gamble Company, Cincinnati, Ohio, Cleveland District National Account, dated September 1, 1955	2882	2115

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 264—Memorandum from ADT Sales Representative J. D. Patton to ADT Executive Accounts Representative F. J. Concannon, captioned, Franklin's, Dallas, Texas, dated December 12, 1956	2884	2117
No. 265—Memorandum by ADT Vice President A. E. Smith to File, captioned, Renewal Agreement, R.K.O. Pictures, Los Angeles, California, dated June 29, 1956	2885	2118
No. 266—Memorandum from ADT District Sales Manager R. T. Warner to ADT General Sales Manager L. J. O'Brien, captioned, The Van Heusen Charles Co., Albany, New York, dated June 25, 1959	2886	2119
No. 267—Memorandum from ADT Special Representative H. E. May to ADT Executive Accounts Representative F. Concannon, captioned, American Sugar Refining Company, Philadelphia, Pennsylvania, dated December 12, 1961	2887	2120
No. 268—Contract agreement for Alarm Engineering Service of the Dayton Electronics Alarm and Signal Co., 530 West Second Street, Dayton 2, Ohio	2889	2121
No. 269—Memorandum from ADT Special Representative H. E. May to ADT Executive Accounts Representative F. J. Concannon, dated January 18, 1960 (excerpts)	2891	2123
No. 270—Memorandum from ADT Special Representative H. E. May to ADT Sales Representative F. Shadell, captioned, Swern & Company-Lit Brothers, Trenton, dated January 5, 1962	2897	2124
No. 271—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Sales Manager L. J. O'Brien, captioned, City Stores, Inc., Philadelphia, Pa., dated January 19, 1960	2898	2125
No. 275—Memorandum from ADT District Sales Manager L. M. De Shane to ADT General Sales Manager L. J. O'Brien, captioned, Ralston Purina Company, Various Locations, U.S.A., dated March 4, 1957	2901	2128
No. 276—Annual Report of the American District Telegraph Company for Fiscal Year 1953 (excerpts)	2903	2129

	Original	Print
Record from the United States District Court for the District of Rhode Island—Continued		
GOVERNMENT'S EXHIBITS—Continued		
No. 277—Letter from ADT Vice President J. A. MacDonald to Grinnell Secretary and Counsel R. T. Clapp, dated July 2, 1953	2915	2132
No. 278—ADT General Circular No. 222, entitled, Direct-Connected Fire and Burglar Alarm Service, signed by ADT Vice President A. E. Smith, dated April 27, 1955	2918	2135
No. 279—Memorandum from ADT General Commercial Manager A. E. Smith to ADT Commercial Superintendent C. L. Chafee, captioned, Competition—Automatic Fire Alarm Systems, Columbus, Ohio, dated March 9, 1953	2924	2149
No. 280—Memorandum from ADT Assistant Director of Public Relations R. M. Bugbee to ADT Director of Public Relations A. W. Sullivan, captioned, Proposed Ordinance—City of Newark, dated December 20, 1962	2928	2153
No. 281—Memorandum from ADT District Sales Manager E. J. Heisley to ADT General Sales Manager L. J. O'Brien, captioned, Competition, Atlanta, Georgia, dated September 15, 1955	2934	2157
No. 282—Memorandum from ADT Assistant Commercial Superintendent, W. K. Francis to ADT General Commercial Manager A. E. Smith, captioned, Regional Conferences, June 4-6 and 18-20, 1953, Competition District No. 9, dated June 9, 1953 (excerpts)	2936	2159
No. 283—Memorandum by Holmes Sales Manager, C. K. Empringham to File, captioned, Malcolm Goldstone, Central Office Alarm Company, dated April 5, 1962	2941	2163
No. 284—Letter from Holmes President H. C. Ward to Grinnell Secretary and Counsel R. T. Clapp, dated September 25, 1952	2942	2164
No. 285—Memorandum from ADT General Commercial Manager A. E. Smith to ADT Commercial Superintendents, captioned, Proprietary Systems, dated October 5, 1963 (excerpts)	2949	2171
No. 286—ADT Pamphlet reporting on ADT Protection Service for 1960 (excerpts)	2965	2173
No. 287—Memorandum from ADT First Vice President J. A. MacDonald to ADT President E. Gaston, dated June 6, 1957	2970	2178

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 288—Minutes of Meeting of the Burglary Rating Committee of the National Bureau of Casualty Underwriters, April 25, 26, 27, 1950	2972	2181
No. 289—Letter from Holmes President H. C. Ward to Grinnell Secretary & Counsel R. T. Clapp, dated October 10, 1952	2974	2184
No. 291—ADT Leaflet entitled, Astute Business Executives are Constantly Proving that it Pays 2 Ways to Protect Property Automatically, Better Protection and Lower Cost	2977	2187
No. 292—Memorandum from ADT Associate Director of Diversification & Expansion G. E. Friedli to ADT Director of Diversification & Expansion J. J. Stephens, captioned, San Jose Peninsula Survey, dated November 28, 1956	2978	2189
No. 294—Memorandum from ADT Commercial Superintendent C. L. Chafee to ADT General Commercial Manager A. E. Smith, captioned, Competition—Cincinnati, Ohio, dated September 2, 1954	2981	2191
No. 295—Memorandum from ADT President E. Gaston to ADT Vice President A. E. Smith, captioned San Diego, California, dated October 25, 1957	2982	2192
No. 296—ADT Acquisition Agreement of the United Electric Service Company, New York, New York, dated July 21, 1931 (excerpts)	2983	2193
No. 297—ADT Acquisition Agreement of the Auxiliary Fire Alarm & Telegraph Co., Philadelphia, Pennsylvania, dated March 26, 1930 (excerpts)	2986	2194
No. 298—AFA central station protection Service Contract forms	2995	2199
No. 299—Memorandum from AFA Vice President F. D. Chase to AFA President T. P. Drew, captioned, Competition, dated September 4, 1958	2998	2203
No. 300—Memorandum from ADT Sales Representative J. J. Viscarde to ADT Assistant to General Sales Manager J. B. Bodley, captioned, Ivers-Lee, Newark, New Jersey, dated June 16, 1960	3000	2205
No. 302—Memorandum from ADT Government and Special Sales Division Manager J. O. Maxey to ADT General Sales Manager L. J. O'Brien, captioned, Competition, Owl Protective Company, New York, New York, dated May 17, 1960	3001	2206

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 303—ADT Leaflet, entitled, Municipalities Served by ADT Central Stations	3003	2208
No. 304—List of Approved Central Station Protection Service Companies which were listed by Underwriters Laboratories, Inc., on December 31, 1961	3007	2216
No. 305—Underwriters Laboratories, Inc. list of approved central station protection companies with the effective listing date	3011	2222
No. 306—Letter from A & P Transport, Inc., President E. G. Snow to Joseph Forman, Call's Police Signal Corporation, Chelsea, Massachusetts, dated July 9, 1959	3018	2228
No. 307—Holmes central station protection service contract forms	3019	2229
No. 308—Stipulation No. 1, Stipulation as to the authority of the documents offered into evidence by Plaintiff	3022	2235
No. 309—Stipulation No. 2, Stipulation as to the volume of commerce across State and District of Columbia lines	3058	2260
No. 310—Stipulation No. 3, Relative market position of central station protection service companies in Underwriters Laboratories, Inc., Certificated central station burglar alarm service	3062	2263
No. 311—Stipulation No. 4, Relative market position of alarm companies in Underwriters Laboratories, Inc., certificated local burglar alarm service	3064	2264
No. 312—Stipulation No. 5, Relative market position of central station protection service companies in the approved station protection service business in the United States	3067	2266
No. 313—Designation of answers of the American District Telegraph Company to interrogatories propounded by Plaintiff (excerpts)	3082	2279
No. 314—Designation of answers of the Holmes Electric Protective Company to interrogatories propounded by Plaintiff	3110	2301
No. 315—Designation of answers of the Automatic Fire Alarm Company of Delaware to interrogatories propounded by Plaintiff	3129	2318
No. 316—Designation of answers of the Grinnell Corporation to interrogatories propounded by Plaintiff	3149	2337
No. 317—Excerpts of deposition testimony of George F. Allebach, Sr., Insurance Rating Bureau of the District of Columbia	3167	2353

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 318—Excerpts of deposition testimony of Emerson M. Booher, Dayton Electronics Alarm & Signal, Inc.	3238	2392
No. 319—Excerpts of deposition testimony of James H. Bray, Alarm Signal Company of Texas	3284	2418
No. 320—Excerpts of deposition testimony of John D. Brosnan, Federal Engineering Company, Inc.	3315	2432
No. 323—Excerpts of deposition testimony of Eugene Curran, Robinson Protective Alarm Company	3439	2488
No. 324—Excerpts of deposition testimony of Clarence S. Damon, Damon Alarm Corporation	3457	2497
No. 325—Excerpts of deposition testimony of Clifford T. Davis, Protection Engineering Corp.	3498	2517
No. 326—Excerpts of deposition testimony of James W. Flotron, Potter Electric Signal Co.	3550	2545
No. 328—Excerpts of deposition testimony of Joseph Forman, Owl Protective Company, General Burglar Alarm Company	3723	2627
Exhibit Volume V		
No. 329—Excerpts of deposition testimony of Malcolm Goldstone, Central Office Alarm Company, Inc.	3778	2647
No. 330—Excerpts of deposition testimony of Malcolm Goldstone, Owl Protective Company, General Burglar Alarm Company	3895	2705
No. 331—Excerpts of deposition testimony of Harold W. Gray, American Burglar Alarm Co. (Pacific Extinguisher Co.)	3955	2735
No. 333—Excerpts of deposition testimony of Sarah E. Jackson, Denver Burglar Alarm Company	4043	2786
No. 334—Excerpts of deposition testimony of Edward J. Lavino, Sentinel Alarm Corporation	4142	2841
No. 336—Excerpts of deposition testimony of Thomas M. Lewin, Automatic Alarm Corporation	4170	2854
No. 337—Excerpts of deposition testimony of Gerald J. Linder, American Fire Dispatch, Inc.	4233	2879
No. 338—Excerpts of deposition testimony of Thomas L. Lugen, Fidelity Electronic Protective Service	4253	2888

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 339—Excerpts of deposition testimony of James H. McDowell, Central Station Signals, Inc.	4280	2897
No. 340—Excerpts of deposition testimony of Kenneth S. McFarlan, Jr., Republic Alarm Company	4341	2919
No. 341—Excerpts of deposition testimony of Peter J. Neumann, Albany Protective Service	4389	2933
No. 342—Excerpts of deposition testimony of Ephraim B. Oberlander, Protection Alarms, Inc.	4414	2943
No. 343—Excerpts of deposition testimony of Arthur T. Orner, Morse Signal Devices, Inc.	4461	2961
No. 345—Excerpts of deposition testimony of Shelton Phillips, Potter Electric Signal Company of Ohio	4501	2974
No. 346—Excerpts of deposition testimony of Donald D. Pillsbury, National Bureau of Casualty Underwriters	4527	2980
No. 347—Excerpts of deposition testimony of Henry J. Poile, Kedzie-Kane Alarm Co.	4558	3004
No. 348—Excerpts of deposition testimony of Charles C. Porch, Factory Mutual Rating Bureau	4599	3019
No. 349—Excerpts of deposition testimony of Walter W. Richardson, American Alarm Company, Inc.	4621	3027
No. 351—Excerpts of deposition testimony of James E. Rose, Michigan Still Alarm Co.	4647	3035
No. 352—Excerpts of deposition testimony of George W. Saunders, Underwriters Laboratories	4730	3069
No. 355—Excerpts of deposition testimony of George A. Smith, Smith Detective Agency & Nightwatch Service	4755	3079
No. 356—Excerpts of deposition testimony of Maurice G. Sondock, McCane-Sondock Detective Agency	4796	3102
No. 357—Excerpts of deposition testimony of Sidney Stackler, Central Watch Service	4819	3113
No. 358—Excerpts of deposition testimony of Lee C. Underdown, Central Alarm Company	4924	3152
No. 359—Excerpts of deposition testimony of Lyle and Joe Underdown, Central Alarm Company	4934	3159
No. 360—Excerpts of deposition testimony of Alex Venners, Federal Engineering Company, Inc.	4950	3169

Record from the United States District Court for the District of Rhode Island—Continued	Original	Print
GOVERNMENT'S EXHIBITS—Continued		
No. 361—Excerpts of deposition testimony of Ira E. Warlick, Reliance Protective, Inc.	4984	3185
No. 362—Excerpts of deposition testimony of Morris F. Weinstock, Morse Signal Devices of California	5004	3198
No. 363—Excerpts of deposition testimony of Samuel G. Wight, Central Alarm Company, Ltd.	5077	3229
DEFENDANTS' EXHIBITS		
A—Schedule of Defendant alarm companies proposed objections to plaintiff's documents—For identification	5100	3242
B—Defendant Grinnell objections to Government documents—For identification	5104	3245
E-1—Minimum basic service charges effective January 1, 1960	5105	3246
E-2—Minimum basic advance service charges effective April 1, 1962	5107	3249
F—Form 701 dated August 1962	5109	3251
G—Form 400 dated February 1963	5110	3252
H-1—Summary in tabular form of contents of Exhibit H—Vocational Listing of Subscribers	5111	3253
Exhibit Volume VI		
I—Letter from L. J. O'Brien to C. L. Chafee, dated September 12, 1955 re: Procter & Gamble Company, Cincinnati, Ohio	5126	3270
F—68-80—Twelve tabulated exhibits and one list of book cities dated October 1, 1962 admitted at completion of testimony of Edward Gaston	5128	3273
J—Summary statement of local alarm accounts in five cities, based on Form 400	5446	3591
K—List of city of Everett, Massachusetts master boxes	5484	3629
L—List of city of Lynn, Massachusetts Police Department connections, (acting Chief George W. Donnelly), dated June 16, 1964	5486	3631
M—List of Everett, Massachusetts Police Station connections (Bradford V. Elliott, Chief of Police), dated June 16, 1964	5488	3632
N—List of master boxes and heat detection connections, Braintree, Massachusetts, Fire Department Headquarters	5489	3633
O—List of Braintree, Massachusetts, Police Department connections	5496	3638

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
Defendants' Exhibits—Continued		
P—List of auxiliary connections in the Fire Department, Lynn City, Massachusetts	5498	3639
Q—List of Weymouth Fire Department direct connected and auxiliary alarm connections	5500	3640
R—List of Brockton Municipal connections, dated December 31, 1963	5502	3643
S—List of Boston Municipal connections, dated January 7, 1963	5503	3644
T—List of Salem Municipal connections, dated January 8, 1964	5504	3645
U—List of U.S. Government contracts (not security classified), December 31, 1963	5505	3647
V—Area list of Government installations, Continental United States, January 1, 1964	5547	3666
W(a)—List of ADT central station SS&WF subscribers in Natick, Needham and Newton, Massachusetts	5549	3667
Z-1—ADT contract form for modified central station service	5550	3669
Z-2—ADT contract form for central station protective signalling service	5552	3673
Z-3—ADT contract form for central station burglary and holdup protection service	5554	3677
Z-4—ADT contract form for direct connected service	5555	3679
Z-5—ADT contract form for local alarm service	5556	3681
K-1—ADT contract form for local alarm service (customer owned system)	5557	3683
L-1—List of representative installations made by ADT using systems and equipment made by others	5558	3685
M-1—List of representative systems installed by others, and sold outright to subscriber, where ADT was called in to restore service, and/or to provide a central station connection	5559	3685
U-1—Letter from Stanley N. Barnes, Assistant Attorney General, Antitrust Division to Frank A. Fritz, dated July 14, 1955	5560	3686
V-1—Statement of (ADT) Company's Revenues, gross and net balance sheet assets and indicated ratios, 1959 to 1963	5561	3687
W-1—Ratio of net earnings to gross assets, net assets and net worth (ADT), 1947 to 1963	5562	3688
X-1—Commercial Circular No. 197, supplement No. 21, dated July 25, 1960, from L. J. O'Brien regarding outright sales prices marked "Confidential"	5563	3689

	Original	Print
Record from the United States District Court for the District of Rhode Island—Continued		
DEFENDANTS' EXHIBITS—Continued		
Y-1—List of offices showing annual and advance service charges secured in excess of minimum basic rates, 1957 to 1962	5564	3690
Z-1—Letter from L. J. O'Brien to J. A. MacDonald, dated August 16, 1960 re Pricing Policy Memorandum from ADT Special Representative J. R. Norris to ADT Commercial Superintendent C. L. Chafee, captioned National Can Corp., Cleveland, Ohio, dated July 23, 1954 (copy) (omitted in printing)	5572 5579	3696 3704
LL—Price Waterhouse & Company letter dated May 27, 1964 to The Board of Directors of ADT with Appendices A, B & C	5580	3705
MM(1-20)—Table of detailed financial data on a city-to-city basis regarding divestiture	5589	3717
NN—Statement of revenue and expenses—1963, New Orleans central station (ADT)	5674	3805
OO—Statement of revenue and expenses—1963, Richmond central station (ADT)	5675	3807
PP—Summary of ADT deficit offices in 1963	5676	3809
QQ—Analysis of advance service charges, city by city, 1957 to 1963	5677	3811
RR—List of advance service charges amortized on a city-to-city basis. Detail of Reply to Government Interrogatory No. 17	5700	3833
SS—Memorandum of J. A. MacDonald dated June 17, 1952 regarding discussions with Grinnell Corporation on June 16, 1952	5705	3839
UU—ADT Board of Directors minutes of June 11, 1952 (excerpts)	5710	3846
VV—Excerpts of ADT Board of Directors minutes for July 9, 1952	5712	3848
WW—Arthur D. Little, Inc. report on U.S. Market for electric protection services, 1961 to 1962	5724	3863
WW-1—Biographical summaries of Messrs. Gottlieb, Frankel & Peters	5806	3947
Exhibit Volume VII		
XX—Interview guide used in conjunction with Arthur D. Little, Inc. survey	5809	3951
YY—Two Sanborn maps of Dubuque, Iowa	5813	3955
ZZ—Interviewer's materials relating to survey of of Dubuque, Iowa—Audit & Surveys, Inc., Forms 1, 2, 3, 4 & 5, Job #1232	5815	3957
AB—Q4 by Q23, amount of square feet occupied—this tabulation is related to Exhibit ZZ. Job #1232	5853	3991

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANTS' EXHIBITS—Continued		
AC—Q4 by Q24, number of employees—this tabulation is related to Exhibit ZZ. Job #1232	5854	3992
AD—Q4 by type of business establishment, types of establishments—this tabulation is related to Exhibit ZZ. Job #1232	5855	3993
AE—Letters from L. J. O'Brien to District Sales Managers, dated April 4, 1956; December 2, 1957; August 7, 1959; August 29, 1960; November 23, 1960; re Form 701	5856	3995
AF—General Services Administration correspondence from September 20, 1962 to January 2, 1963	5861	3998
C-1—C-5—Defendant Alarm Companies objections to plaintiff's designations of deposition testimony	5893	4029
DEFENDANT GRINNELL CORPORATION'S EXHIBITS		
J-2—1950 Annual Report of the Grinnell Corporation	5899	4050
J-5—1953 Annual Report of the Grinnell Corporation	5912	4064
J-39—Index to Grinnell Corporation Catalog, dated 1960	5923	4075
J-40—AFA Company Balance Sheet, dated December 31, 1948	5936	4110
J-43—Agreement dated February 28, 1949 between Grinnell Corp. and Marine Midland Trust Co. of New York	5938	4111
J-44—Minutes of the Executive Committee of the Board of Directors, Grinnell Corp., March 23, 1949 (excerpts)	5941	4113
J-45—Letter from W. G. Hampton, Assistant Vice President, New York Telephone Co. to J. D. Fleming, President Grinnell Corp., dated February 20, 1950	5943	4114
Income statements of Holmes Electric Protective Company for the years 1921-1949	5944	4117
J-47—Agreement dated April 14, 1950 between New York Telephone Co. and Grinnell Corp.	5946	4120
J-48—Closing Memorandum (undated)	5996	4158
J-49—Letter from W. J. Klickhauf, Apple-Cole Co., to J. D. Fleming, dated May 4, 1953	6001	4163
J-50—Agreement dated June 16, 1953 between Western Union Telegraph Co. and Grinnell Corp. with Exhibits A-E	6002	4164
J-51—Loan Agreement, dated July 27, 1953 between Grinnell Corp. and the Equitable Life Assurance Society (excerpts)	6035	4199

Record from the United States District Court for the District of Rhode Island—Continued

DEFENDANT GRINNELL CORPORATION'S EXHIBITS—Continued

	Original	Print
J-52—Letter from Stanley N. Barnes, Assistant Attorney General to J. D. Fleming, dated June 29, 1953	6052	4205
J-53—Letter from Roger T. Clapp to W. D. Gaillard, Jr., Milbank, Tweed, Hope & Hadley, dated July 2, 1953	6054	4206
J-54—Letter from Roger T. Clapp to M. J. Bloomer, Jr., Wickes, Riddell, Bloomer, Jacobi & McGuire, dated July 2, 1953	6055	4207
J-55—Letter from Stanley N. Barnes, Assistant Attorney General to Frank A. Fritz, dated July 23, 1953	6057	4208
J-56—Letter from Frank A. Fritz to Ephraim Jacobs, Department of Justice, Antitrust Division, dated July 13, 1953	6058	4209
J-59—Memo dated July 24, 1950 from Roger T. Clapp to Department Managers, Fire Protection Division	6063	4212
J-60—Memo dated June 10, 1963 from Roger T. Clapp to Department Managers, Fire Protection Division	6064	4214
J-62—Memo dated February 20, 1954 from O. L. Swats, Manager, Fire Protection Division to Department Managers, Contracting Engineers, et al.	6065	4215
J-65—Memo dated April 21, 1950 from H. C. Ward to All Holmes Employees	6066	4216
J-66—Letter from J. A. MacDonald to Roger T. Clapp dated June 24, 1953	6068	4218
J-69—Memorandum of Material for Discussion with Messrs. Gaston and MacDonald on June 16	6070	4219
J-70—Letter from Bleakley, Platt, et al. to the Equitable Life Assurance Society, dated July 23, 1953	6076	4226
J-74—Minutes of a special meeting of the Board of Directors of the Grinnell Corporation dated June 2, 1953	6077	4227
J-75—Statement showing "1928-1937 Earnings Data"—Grinnell Corporation	6079	4229
J-75(1)—General Fire Extinguisher Co.—Report of the Treasurer To The Board of Directors for Twelve Months Ended December 31, 1928 (excerpts)	6080	4230
J-75(2)—Ended December 31, 1929 (excerpts)	6087	4238
J-75(3)—Ended December 31, 1930 (excerpts)	6094	4246
J-75(4)—Ended December 31, 1931 (excerpts)	6101	4254

Record from the United States District Court for the District of Rhode Island—Continued

DEFENDANT GRINNELL CORPORATION'S EXHIBITS—Continued

	Original	Print
J-75(5)—Ended December 31, 1932 (excerpts)	6114	4262
J-75(6)—Ended December 31, 1933 (excerpts)	6125	4270
J-75(7)—Ended December 31, 1934 (excerpts)	6134	4277
J-75(8)—Ended December 31, 1935 (excerpts)	6143	4285
J-75(9)—Ended December 31, 1936 (excerpts)	6154	4293
J-75(10)—Ended December 31, 1937 (excerpts)	6163	4301
J-76—Plaintiff's Answers to Certain Interrogatories of Alarm Company Defendants	6172	4309
Appendix A—Letter from Stanley N. Barnes, Assistant Attorney General to Frank A. Fritz, dated July 23, 1953 (copy) (omitted in printing)	6187	4318
Appendix B—Letter from Stanley N. Barnes, Assistant Attorney General to J. D. Fleming, dated June 29, 1953 (copy) (omitted in printing)	6188	4318
Appendix C—Letter from Frank A. Fritz to Ephraim Jacobs, Department of Justice, Antitrust Division, dated July 13, 1953 (copy) (omitted in printing)	6190	4318
J-77—Balance sheet and income statements of AFA as of June 30, 1948	6195	4319

DEFENDANT ADT'S EXHIBITS

A9—Memo dated December 15, 1952 from J. L. Hardesty to H. R. Eakin, Plant Superintendent, captioned Competition—Washington, D. C.	6201	4323
—Memo dated December 22, 1952 from J. B. Bodley to A. E. Smith captioned "Federal Engineering Co., Inc., Washington, D. C.	6202	4324
A13—Memo dated September 29, 1953 from A. E. Smith to J. A. MacDonald captioned Westchester County	6203	4324
—Memo dated September 14, 1951 from W. J. Doyle, Commercial Superintendent, to A. E. Smith, captioned Modified Central Station Burglar Alarm Service	6206	4326
A31—Letter dated March 23, 1959 from Jamie Bray, Alarm Signal Company of Texas to Frank E. Guibert	6209	4331
A36—Handwritten letter dated June 2, 1962 from T. E. Smith to Mr. Haberman captioned Competition, San Antonio, Texas—Texas Industrial Surveys	6212	4334

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
Defendant ADT's Exhibits—Continued		
A37—Letter dated October 18, 1955 from J. K. Scott to A. S. Cook, Manager, captioned Riverside Protective Association, Houston 9, Texas	6214	4335
A38—Letter dated October 1, 1959 from R. F. Ethridge to R. T. Warner, captioned The Polaroid Company, Dallas, Texas	6215	4336
A39—Letter dated June 22, 1959 from S. W. Christian to J. B. Rustic, captioned Competition—El Paso	6216	4337
A40—Letter dated March 15, 1960 from J. D. Patton to L. J. O'Brien, captioned Competition	6217	4338
A41—Letter dated December 11, 1956 from C. A. Southard to J. K. Scott, captioned Scobey Fireproof Storage Company, San Antonio, Texas	6218	4338
A47—Memo dated November 2, 1959 from J. B. Bodley to E. J. Heisley, captioned Competitive Fire-Alarm System, Pittsburgh, Pa.	6219	4340
A49—Memo dated November 20, 1962 from Jake Kowalyk to W. J. Robinson, captioned Competition—Pittsburgh	6220	4341
A51—Memo dated March 12, 1956 from W. J. Dahl to L. J. O'Brien captioned Boeing Airplane Company, Seattle, Washington, Conversion	6223	4344
A52—Letter dated March 14, 1956 from T. I. Young to W. J. Dahl, re: Boeing Airplane Company, Seattle, Washington, Conversion	6224	4345
A53—Memo dated January 30, 1956 from J. J. Stephens to J. A. MacDonald, captioned Direct Connected Services, Competition and Compensation	6225	4345
A54—Memo dated February 15, 1956 from R. M. Bugbee to A. W. Sullivan, captioned Gamewell Competitions, Indiana	6229	4350
A55—Memo dated October 10, 1955 from A. W. Sullivan to L. J. O'Brien, captioned Competition, Kenosha, Wisconsin	6230	4351
A57—Memo dated July 30, 1955 from R. V. Haight to H. B. Schultz	6231	4352
A61—Letter dated January 4, 1954 from E. J. Heisly to A. E. Smith, re: Wurzburg Bros., Memphis, Tenn. (Factory Mutuals)	6232	4353
A62—Memo dated September 24, 1953 from J. Heath, Jr., to E. B. White, re Los Angeles and Salt Lake Railways, Los Angeles 23, California	6233	4354

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
A63—Memo dated March 20, 1953 from W. B. O'Hara to D. E. Kloster, re: Erie Resistor Corp., Erie, Pa.	6234	4355
A64—Memo dated February 12, 1953 from O. T. Blank to F. J. Concannon, re: Benjamin Moore Co., Denver, Colorado	6235	4356
A66—Memo dated March 6, 1952 from E. A. Rogers, Jr. to A. S. Cook, re: Competition, Wild & Stevens, Inc., Needham Street, Newtonville, Mass.	6236	4357
A67—Memo dated October 2, 1952 from N. Slavin to A. S. Cook, re: Hotels Statler Company, Hartford, Connecticut	6237	4359
A68—Memo dated April 7, 1952 from D. R. Hall to A. S. Cook, re: Ford Motor Company, Natick, Mass.—Compulsory Tour Service	6238	4359
A70—Memo dated January 18, 1952 from D. R. Hall to W. R. Boos, re: Ford Motor Company, Edgewater, New Jersey	6239	4361
A71—Memo dated September 5, 1951 from E. J. Heisley to A. E. Smith, re: Union Bag and Paper Company, Savannah, Georgia	6240	4362
A77—Memo dated August 11, 1955 from J. B. Bodley to L. J. O'Brien captioned Competition—Richmond, Virginia	6241	4363
—Memo dated August 8, 1955 from R. O. Beckham to J. B. Bodley entitled Competition—Richmond, Virginia	6242	4364
A78—Memo dated June 1, 1953 from T. J. Yocom to E. B. White entitled Competition Report	6244	4365
A79—Memo dated July 1, 1959 from Ray Brechbill to Lyle Straus entitled Competition—Fort Worth	6246	4366
A82—Memo dated March 18, 1955 from W. J. Doyle to J. A. Webb, re: The Jamison Plastic Corporation, North Bellmore, Long Island, N.Y.	6245	4367
A84—Memo dated October 10, 1952 from G. J. Simon to John Hannon entitled Beth Israel Hospital, New York City	6247	4368
A85—Memo dated December 9, 1952 from W. J. Doyle to C. S. Hammergren re: Beth Israel Hospital, New York, N.Y.	6248	4369
A86—Memo dated April 8, 1957 from W. R. Boos to W. J. Doyle re: Duro-Test Corp., Secaucus, New Jersey	6249	4370

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
A89—Memo dated July 29, 1958 from C. H. Sanders to W. J. Doyle re: Globe Products Co., Inc., Webro Road, Clifton, New Jersey	6250	4371
A95—Memo dated August 6, 1951 from A. E. Smith to John Hannon captioned Auxiliary Fire Alarm Service, Trenton, New Jersey	6252	4373
A98—Memo dated January 5, 1952 from M. E. Hubert to W. W. Dooley, captioned First National Bank, Omaha, Nebraska	6253	4374
B8—Memo dated March 21, 1961 from A. S. Jacks to L. J. O'Brien captioned Competition, Erie, Pennsylvania	6254	4375
B9—Memo dated November 21, 1960 from J. J. Caffrey to L. J. O'Brien captioned Competitive Advertising	6256	4376
B11—Memo dated May 19, 1959 from R. J. Dellinger to A. S. Jacks re: Gamewell Competition—Erie, Pennsylvania	6260	4379
B12—Memo dated March 7, 1959 from R. J. Dellinger to A. S. Jacks re: Gamewell Company	6262	4381
B13—Memo dated May 17, 1959 from R. M. Bugbee to A. S. Jacks re: Gamewell Competition—Erie, Pennsylvania	6263	4382
B17—Memo dated May 5, 1958 from F. T. Turner to J. B. Rustic captioned "Auxiliary Fire Alarm Systems—City of Pittsburgh, Pennsylvania"	6264	4383
B18—Memo dated April 11, 1958 from R. T. Warner to L. J. O'Brien captioned "Olin Mathieson Chemical Corp., New Haven, Conn."	6266	4385
B19—Memo dated March 28, 1958 from W. J. Dahl to A. W. Sullivan captioned Competition—Fire Alarm Service, City of Portland, Oregon, Auxiliary Fire Alarm Systems connected to Municipal Circuits	6269	4387
B20—Memo dated March 25, 1958 from H. E. Peters to A. S. Jacks captioned Competition	6271	4389
B21—Memo dated October 15, 1957 from "District Sales Manager" (RTW) to L. J. O'Brien, captioned Insurance Relations—FIA and FM	6273	4390
B24—Memo dated June 7, 1956 from G. B. Fosmire to C. L. Chafee, captioned Competition—Columbus, Ohio	6275	4392
B30—Memo dated September 24, 1954 from D. M. Gates to C. L. Chafee	6277	4393

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ALT's EXHIBITS—Continued		
B33—Memo dated September 15, 1954 from J. A. MacDonald to A. W. Sullivan entitled Notifier Mfgs. Co.	6278	4395
B34—Memo dated September 10, 1954 from L. J. O'Brien to J. A. MacDonald re Competition—Notifier Alarm Co.—Spurling Automatic Fire Alarm Co.	6279	4396
B38—Memo dated August 30, 1954 from R. L. Hopf to C. L. Chafee re Competition—Spurling & Notifier	6280	4397
B40—Memo dated June 8, 1954 from Oper. Supt. (DHB) to J. B. Rustic, re Competition—Lincoln, Nebraska	6281	4398
B92—Memo dated September 18, 1952 from R. M. Bugbee to A. E. Smith, re Atmo Competition—New Haven, Conn.	6284	4400
B94—Letter from "Koos Bros." signed by George O. Klemp to B. W. Fox, Anchor Motor Freight-New York Corp., Linden, New Jersey, dated August 15, 1952	6286	4402
B95—Memo dated September 24, 1952 from A. F. Clunan to W. J. Doyle, re Competition—Atmo, Linden Investment Co., Linden, New Jersey	6287	4403
C1—Memo dated May 14, 1951 from R. M. Bugbee to A. S. Cook re Atmo Competition, New Haven, Connecticut	6288	4404
C3—Memo dated July 22, 1957 from J. B. Bodley to O. E. Betscher, captioned M. H. Connell Associates, Miami, Florida	6289	4405
C4—Memo dated July 27, 1962 from C. C. Rasmussen, Jr. to W. J. Robinson, re *"United States* v. *Grinnell Corp. et al."*	6290	4406
C8—Memo dated July 11, 1952 from R. M. Pinio to B. H. Sofge re Ace Burglar Alarm Company, Hartford, Connecticut	6291	4407
C10—Memo dated July 7, 1952 from K. E. Berrett to R. M. Pineo, re Ace Burglar Alarm Company, Hartford, Connecticut	6292	4408
C13—Memo dated July 1, 1960 from D. H. Barnett to L. J. O'Brien re "Proposed Councilmen's Bill, Denver, Colorado"	6293	4409
C14—Memo dated November 29, 1954 from "Vice President" to L. J. O'Brien re Denver Ordinance	6296	4412
C15—Copy of Ordinance allowing Denver Banks to install direct connect alarms, Series of 1954	6298	4414

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
C21—Memo dated December 18, 1952 from W. K. Francis to E. B. White re Competition—Tele-Fire of California, Pasadena, California	6301	4417
C22—Memo dated April 17, 1953 from J. Heath, Jr. to E. B. White re competition—Fullerton Mutual Orange Ass'n., Inc., Fullerton, California	6304	4421
C26—Memo dated April 11, 1958 from W. K. Francis to L. J. O'Brien, entitled Competition—Sacramento, California	6305	4422
C31—Memo dated August 28, 1962 from W. J. Kupper to Ray Brechbill, re District #13—Sales Integrity and Competition	6306	4423
C32—Memo dated June 16, 1954 from W. K. Francis to E. B. White re Sears, Roebuck & Company, Tucson, Arizona	6315	4432
C33—Memo dated April 29, 1957 from J. A. MacDonald to J. B. Rustic, re Competition—Spurling Fire Alarm & Indicator Co., Louisville, Kentucky	6317	4434
C34—Memo dated December 21, 1956 from W. J. O'Meara to E. O. Betscher, re Yellowstone Distillery, Inc., Shively, Kentucky	6318	4435
C35—Memo dated November 30, 1956 from E. O. Betscher to L. J. O'Brien, re Competition—Spurling Fire Alarm & Indicator Company, Louisville, Kentucky	6319	4436
C36—Memo dated September 12, 1956 from J. B. Bodley to E. O. Betscher, re Competition—Spurling Fire Alarm & Indicator Company, Louisville, Kentucky	6321	4439
C40—Memo dated September 7, 1955 from A. A. Balestrino to C. C. Chafee re Competition—Cincinnati, Ohio	6323	4440
C41—Memo dated September 10, 1954 from R. L. Hopf to C. L. Chafee re Competition—Direct Connect to Fire Tower	6324	4442
Agreement between the City of Cincinnati and Spurling granting direct connect permission, dated August 6, 1954	6325	4443
C42—Memo dated September 17, 1953 from E. J. Heisley to A. W. Sullivan, re Auxiliary & Direct Connect Competition, Charleston, South Carolina	6326	4445
C49—Memo dated March 4, 1960 from D. R. Hall to R. T. Warner, re GMC, New Departure Division, Bristol, Connecticut	6328	4448

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT's EXHIBITS—Continued		
C53—Memo dated May 6, 1958 from R. G. Dodd to L. M. DeSchane re: Mid-West Conveyor Company, Inc., Kansas City, Kans.	6329	4449
C55—Memo dated April 4, 1958 from R. G. Dodd to L. M. DeSchane	6331	4451
C59—Memo dated March 14, 1957 from L. M. DeSchane to L. J. O'Brien re: Competition—Omaha and Lincoln, Nebraska	6332	4452
C60—Memo dated February 11, 1957 from H. E. Elster to D. H. Barnett re: Competition—Omaha, Notifier and Dictograph Corp.	6333	4453
C61—Memo dated January 9, 1957 from Ray Brechbill to E. Turnbull captioned Competition—Oshkosh, Wisconsin	6336	4456
C66—Memo dated May 27, 1955 from "E.O.B." to L. J. O'Brien captioned Banks, Direct Connect Privilege	6337	4457
C67—Memo dated May 23, 1955 from "District Operating Superintendent" to J. B. Rustic captioned B. A. System By Diebold, Inc., Canton, Ohio	6338	4458
—Newspaper clipping describing the ultrasonic device used by Diebold in local and direct connect vault alarm service	6339	4459
C76—Memo dated August 13, 1954 from R. L. Beckwith to D. R. Hall	6340	4460
C81—Memo dated November 11, 1953 from L. J. O'Brien to E. P. Hagan re Competition—Diebold, Police Headquarters, Milwaukee, Wisconsin	6341	4461
C87—Memo dated January 5, 1952 from M. E. Hubert to Mr. Dooley, Re: First National Bank, Omaha, Nebraska	6343	4463
C89—Memo dated January 13, 1958 from R. A. Bewes to R. T. Warner, Re: State of New York Executive Department, Division of Military and Naval Affairs, Albany, N.Y.	6344	4464
C91—Memo dated June 27, 1962 from W. K. Francis to Ray Brechbill, Re: Golden Gateway, Redevelopment Project, San Francisco, California	6346	4466
C97—Memo dated February 27, 1957 from D. R. Hall to L. J. O'Brien, Re: Proprietary Systems, GMC, Chevrolet Division, Ford Motor Company, Chrysler Motors Corporation	6347	4467

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT's EXHIBITS—Continued		
D1—Memo dated August 19, 1952 from Commercial Superintendent to A. E. Smith re Aero Competition—Boston, Mass.	6349	4469
D11—Memo dated December 7, 1962 from W. A. Clark to W. C. Marin re The John Shillito Co., Cincinnati, Ohio	6350	4471
D15—Memo dated August 1, 1961 from F. J. Concannon to L. J. O'Brien captioned Julius Kessler Distilling Company, Calvert Distilling Company, Jeffersonville, Indiana (Louisville)	6352	4472
D18-1—Memo dated February 2, 1961 from R. L. Beckwith to J. K. Swanson re: Jacobsen's, Jackson, Michigan	6354	4474
D18-2—Memo dated December 26, 1960 from Ray Brechbill to L. J. O'Brien re: American Hard Rubber Company, Akron, Ohio	6356	4476
D20—Memo dated August 31, 1960 from L. J. O'Brien to District Sales Managers and Representatives, captioned Competition—Minneapolis-Honeywell	6357	4477
D21—Memo dated January 20, 1959 from M. H. A. Lindsay to J. A. MacDonald captioned Minneapolis-Honeywell Regulator Co., Minneapolis, Minnesota	6359	4479
D22—Memo dated August 16, 1960 from N. R. Brady to J. B. Bodley re Travelers Broadcast House, Hartford, Conn.	6361	4482
D24—Memo dated July 8, 1960 from J. B. Bodley to all ADT executive officers, re "Competition—Minneapolis-Honeywell Company"	6362	4484
D26—Memo dated April 29, 1960 from A. S. Jacks to H. B. Schultz re Tri-County Shopping Center—Shillito's, Federated Department Store	6364	4486
D27—Memo dated February 3, 1960 from M. H. A. Lindsay to J. A. MacDonald re Minneapolis Honeywell Regulator Company and Competition in general	6365	4487
D28—Competition Report—November 20, 1962—West Orange, New Jersey. Job lost to Kidde Atmo	6368	4491
D30—Memo dated August 9, 1961 from M. H. A. Lindsay to L. J. O'Brien re New CIA Headquarters, Washington, D. C. area	6369	4493
D32—Memo dated June 13, 1960 from A. Gaston to L. J. O'Brien re L. Bamberger & Company, Newark, New Jersey	6370	4494

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
D33—Memo dated January 26, 1960 from F. D. Shadell to W. J. Doyle re Competition	6371	4495
D36—Memo dated January 31, 1956 from J. R. Hough to E. O. Betscher re Spurling and Kidde, Miami, Florida	6373	4497
D40—Memo dated January 14, 1954 from A. W. Sullivan to A. E. Smith captioned Atmo Competition	6375	4498
D41—Memo dated April 2, 1953 from "General Superintendent" to R. M. Pineo captioned Atmo Fire Alarm Company, Bridgeport, Conn.	6376	4499
D42—Memo dated May 27, 1953 from R. M. Bugbee to A. E. Smith captioned Atmo Competition—New Haven, Conn.	6377	4500
D45—Memo dated October 22, 1952 from W. J. Doyle to A. E. Smith re: Automatic Fire Alarm Competition, State of New Jersey	6378	4501
D46—Memo dated October 14, 1952 from F. H. Langille to W. J. Doyle re: Automatic Fire Alarm Competition, State of New Jersey	6380	4502
D51—Memo dated September 2, 1954 from E. J. Kaiser to King Young re: Competition	6381	4503
D59—Memo dated April 8, 1959 from J. T. Lynch to R. T. Warner re: The New Haven Board and Carton Co., New Haven, Conn.	6382	4504
D62—Memo dated March 12, 1957 from L. B. Straus to L. J. O'Brien re: Marshall Field & Co., Park Forest, Illinois	6384	4506
D75-B—Underwriters' Laboratories, Inc. Accredited Central Stations by date of approval since 1945	6385	4507
D75-E—Manual of Burglary Insurance (excerpts)	6387	4509

Exhibit Volume VIII

D89—Memo dated July 28, 1960 from Ray Brechbill to R. J. Highstone re: Highland Park Police Department, Highland Park, Illinois	6391	4523
D92—Memo dated January 5, 1960 from R. P. Lucy to W. K. Francis re: Bemis Bag Co., Newark, California	6392	4524
D93—Memo dated October 5, 1954 from L. J. O'Brien to A. E. Smith re: Direct Connected Competition—Diebold Company and Gamewell Co., Sioux City, Iowa	6393	4525

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
D97—Memo dated June 30, 1955 from C. L. Chafee to A. E. Smith re: Competition—Cincinnati, Ohio	6395	4526
E1—Sprinkler Supervisory Coordinating Instructions No. 3, dated November 24, 1953 from C. S. Hammergren to All ADT Subsidiaries	6396	4528
E3—Letter from W. J. Dahl to A. W. Sullivan dated February 11, 1959, captioned Competition—Tacoma, Washington	6398	4530
E4—Letter from S. H. Filipkowski to W. B. Flammer, dated August 6, 1956, captioned ADT Competition, Birmingham, Alabama	6400	4532
E6—Memorandum from the Service Superintendent of ADT, Detroit, Michigan to Mr. Swanson, District Manager, dated October 10, 1960, captioned Competition—Detroit, Michigan	6401	4533
E7—Memorandum from W. K. Francis to L. J. O'Brien, entitled Competition, San Francisco, California	6402	4534
E8—Memorandum from R. T. Warner to L. J. O'Brien, dated April 6, 1960, captioned Competition	6405	4538
E9—Memorandum from E. J. Heisley to L. J. O'Brien captioned Competition—Washington, D. C., dated April 15, 1960	6407	4541
E10—Memorandum from A. S. Jacks to L. J. O'Brien dated April 25, 1960, captioned Competition—Cleveland District	6410	4543
E-13—Letter from C. L. Chafee to L. J. O'Brien, dated June 7, 1957, captioned Competition—Radar Eye Corporation	6412	4547
E14—Memorandum from C. L. Chafee to L. J. O'Brien, dated May 13, 1957 captioned Competition—Cleveland, Ohio	6413	4548
E15—Memorandum from E. J. Heisley to L. J. O'Brien, dated April 17, 1957, captioned Competition Radar-Eye	6414	4549
E16—Memorandum from R. T. Warner to L. J. O'Brien, dated March 8, 1957, captioned Competition—Radar-Eye	6415	4550
E18—Memorandum from E. J. Heisley to L. J. O'Brien, dated March 6, 1957, captioned Competition—Radar-Eye	6416	4551
E19—Photostatic copy of an advertisement for the Radar-Eye Protection System as published in the Buffalo Carrier Express Newspaper, February 11, 1958	6417	4553

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT ADT'S EXHIBITS—Continued		
E22—Memorandum from A. L. Kauffman to W. W. Dooley, dated August 12, 1954, captioned Competition—Denver, Colo.	6418	4555
E28—Memorandum from W. E. Mauroschadt to E. J. Heisley, dated December 18, 1956, captioned Competition, First Camden National Bank, Camden, New Jersey	6419	4556
E-32—Memorandum from D. R. Hall to L. J. O'Brien, dated March 21, 1956, captioned Competition—Diebold Bank Alarms	6420	4557
E-36—Memorandum from C. K. Empringham to Mr. John Stephens, dated August 30, 1955	6421	4558
E48—Memorandum from Lynne Stora to E. B. White, dated August 9, 1954, captioned Continental Can Company, Sacramento, California	6422	4559
E52—Letter from the President of ADT to the President of Holmes Electric Protective Company, dated March 27, 1947	6424	4561
E53—Letter from H. C. Ward, President, Holmes Electric Protective Company to E. A. Ward, President, ADT, dated March 26, 1947	6425	4561
E55—Memorandum from E. Turnbull to L. J. O'Brien, dated November 27, 1956, captioned "Certificate—Holdup Alarm, Minneapolis District"	6426	4562
E56—Memorandum from M. H. A. Lindsay to J. A. MacDonald, dated January 20, 1959, captioned Southdale Shopping Center, Minneapolis, Minnesota	6427	4563
E57—Memorandum from L. H. Pryor to E. Turnbull, dated June 20, 1956, captioned Electro-Watchman, Inc.	6430	4566
E58—Memorandum from L. H. Pryor to E. Turnbull, dated May 29, 1956, captioned Electro-Watchman, Inc., St. Paul, Minnesota	6432	4569
E60—Memorandum from D. R. Hall to L. J. O'Brien, dated September 2, 1958, captioned McConnell Kerr Company, Detroit, Michigan	6434	4571
E61—Contract competition report form 701 involving a prospect in Grand Rapids, Michigan	6435	4573
E69—Memorandum from R. T. Warner to L. J. O'Brien, dated April 12, 1957, captioned Competition—The Federal Burglar Alarm Company, Boston, Massachusetts	6436	4575
E70—Memorandum from R. T. Warner to L. J. O'Brien, dated January 8, 1958	6437	4575

Record from the United States District Court for the District of Rhode Island—Continued

DEFENDANT ADT'S EXHIBITS—Continued	Original	Print
E71—Memorandum from R. T. Warner to L. J. O'Brien, dated September 12, 1956, captioned Kennedy's Inc.	6438	4577
E72—Memorandum from N. R. Brady to R. T. Warner, dated July 25, 1956	6439	4578
E82—Memorandum from E. J. Pucci to W. Hable, dated January 18, 1963, captioned Legislation—Laws and Ordinances Passed by City Councils and State Legislatures in the Minneapolis District—Davenport—Moline	6440	4579
—Attachments—Newspaper clippings	6441	4579
E84—Memorandum from E. Turnbull to L. J. O'Brien, dated July 27, 1960, captioned Competition—Cedar Rapids, Iowa	6445	4581
E86—Memorandum from D. R. Hall to L. J. O'Brien, dated September 2, 1958, captioned The Columbia-Western Corporation, South Bend, Ind.	6447	4583
E89-1—Letter from C. A. Wiborg, Lumbermen's Mutual Casualty Company to the Holmes Electric Protective Company, dated January 30, 1956, captioned Stewart Warner, Inc.	6448	4584
E-89-2—Letter from E. J. Heisley to A. E. Smith, dated December 7, 1954, captioned Police Department Competition, Atlanta, Georgia	6449	4585
F16—Memorandum from the Secretary of ADT to J. A. MacDonald, dated June 24, 1963, captioned The Citizens & Southern National Bank, Atlanta, Georgia	6451	4589
F20—Memorandum from W. J. Dahl to Ray Brechbill, dated March 5, 1964, captioned Public Relations, Fire Department, Salt Lake City, Utah	6458	4597
F42—Memorandum from J. J. Hayden to J. K. Scott, dated September 23, 1963, captioned Southern Burglar Alarm Co., Atlanta, Georgia	6463	4603
F43—Memorandum from P. K. Labadie to W. C. Martin, dated April 23, 1964, captioned Competition	6464	4604

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANT HOLMES ELECTRIC PROTECTIVE COMPANY'S EXHIBITS		
H4—Pamphlet of the Autocall-Howe Plant Protection Systems	6466	4605
H5—Letter from C. K. Empringham to Howard Stores, Inc., Brooklyn, N.Y., dated August 31, 1959	6475	4615
H11—Report by J. G. Healey, Superintendent of Shops and Supplies, on the Local Alarm Conference, held November 4, 1960 in the President's Office, dated November 4, 1960 (excerpts)	6478	4617
H16—Leaflet called "Protective Bulletin" issued by the Insurance and Protective Department, American Bankers Association, for March, 1960	6483	4619
H18-1—Letter from H. C. Ward to P. R. Webb dated April 16, 1952	6485	4622
H18-2—Memorandum from V. Wierman, Diebold, Inc., August 6, 1955	6488	4627
H-23—Competition report of Holmes, dated June 9, 1961, Pittsburgh, Pa. for the protection account of the Keystone Iron & Metal Company	6490	4629
H-26—Holmes Business Form No. 640 states that Holmes was bidding against a local alarm company for the protection account of Citra Trading Corp.	6491	4630
H-30-1—Competition Report of the Holmes Electric Protective Company, dated January 3, 1963 in Philadelphia for the protection account of the Strait Advertising Company, Incorporated	6492	4631
H30-2—Letter from T. L. Weber to Bruce D. Crockett, dated August 7, 1962, captioned Competitive Activity	6493	4633
DEFENDANTS' EXHIBITS (Depositions)		
W2a—Excerpts of deposition testimony of Joseph E. Cunningham, A. P. F. Company	6494	4634
W4a—Excerpts of deposition testimony of M. I. Brod, Accurate Burglar Alarm Service	6523	4646
W5a—Excerpts of deposition testimony of Gerson Zimmerman, Ace of Spades Burglar Alarm Company	6537	4649
—Exhibits and handwritten corrections	6648	4700
W6a—Excerpts of deposition testimony of Thomas J. Smith, Alarm Engineering Company, Inc.	6660a	4708
—Exhibits A thru E	6660xxx	4754
W7a—Excerpts of deposition testimony of John W. Callaghan, Alarm Systems, Inc.	6660eeee	4765
W8a—Excerpts of deposition testimony of Joseph Siegel, Alert Alarm Company	6662	4788

Record from the United States District Court for the District of Rhode Island—Continued		
DEFENDANTS' EXHIBITS (Depositions)—Continued	Original	Print
W9a—Excerpts of deposition testimony of George J. Kusta, Arrow Electric Protection Company	6713	4807
W10a—Excerpts of deposition testimony of Eric David, Tattle-Tale Alarms	6813	4843
W11a—Excerpts of deposition testimony of Roy Van Wagner, Autocall Company	6861	4861
—Affidavit of Roy Van Wagner, dated August 7, 1963	6905	4880
W12a—Excerpts of deposition testimony of Frank W. Houghton, Automatic Alarms	6907	4881
—Exhibits 7, 8, 13 and 14	7006	4921
W13a—Excerpts of deposition testimony of Everett A. Westphal, Bay Alarm Company	7012	4925
W14a—Excerpts of deposition testimony of Morton Baizer, Bell Burglar Alarms and Eagle Protective Company	7073	4951
W16a—Excerpts of deposition testimony of Joseph G. Wilson, Central Burglar Alarm Service and Surety Alarm Company	7166	4987
—Exhibits 1 & 2	7255	5026
W17a—Excerpts of deposition testimony of Arthur A. Schwartz, Certified Burglar Alarm Systems, Inc.	7261	5039
W18a—Excerpts of deposition testimony of Clarence W. Novak, Chicago Mercantile Police Alarm Systems	7437	5115
W19a—Excerpts of deposition testimony of James H. Coffey, Circle Alarm Corporation	7455a	5122
W21a—Excerpts of deposition testimony of Kenneth M. Holmes, Dallas Burglar Alarm Company	7458	5152
W22a—Excerpts of deposition testimony of Claude L. Carpenter, Dawn Patrol Burglar Alarm Company	7490	5166
—Exhibits 2 and 4	7565	5192
W23a—Excerpts of deposition testimony of Grant Richard Hamilton, Day & Night Burglar Alarm Company	7570	5196
Exhibit Volume IX		
W24a—Excerpts of deposition testimony of Alfred Wayne Jackson, Diebold, Incorporated	7626	5215
W25a—Excerpts of deposition testimony of R. Stafford Edwards, Edwards Company	7742	5255
W26a—Excerpts of deposition testimony of Lyle A. Vadnais, Electro Watchman, Inc.	7784	5281

Record from the United States District Court for the District of Rhode Island—Continued

	Original	Print
DEFENDANTS' EXHIBITS (Depositions)—Continued		
W27a—Excerpts of deposition testimony of Gerald R. DeLue, Frontier Guard and DeLue, Inc.	7845	5308
W28a—Excerpts of deposition testimony of Arthur William Fruh, A. W. Fruh & Company	7916	5344
W29a—Excerpts of deposition testimony of Harry Gerber, Gerber & Company	7935	5354
W30a—Excerpts of deposition testimony of Loys C. Bridges, Greenville Avenue Patrol	7998	5378
W31a—Excerpts of deposition testimony of Milton Pierce, Guardian Alarm Company	8035	5395
W32a—Excerpts of deposition testimony of Julian C. Cohn, Robert Hall Clothes, Inc.	8097	5418
W33a—Excerpts of deposition testimony of Kenneth V. McCluskey, Howard Stores Corporation	8113	5423
W34a—Excerpts of deposition testimony of John S. Nacey, Howe Electric Company	8128	5429
W36a—Excerpts of deposition testimony of John H. Trout, International Business Machines Corporation	8219	5459
W37a—Excerpts of deposition testimony of Gordon Dillard, Magnetic Alarm Inc.	8244	5469
W38a—Excerpts of deposition testimony of Clarence Irvin Baker, Merchants Alarm Service	8314	5491
W39a—Excerpts of deposition testimony of Russell W. Laxson, Minneapolis Honeywell Regulator Company	8399	5530
W40a—Excerpts of deposition testimony of William Baggett, Mossie Burglar Alarm Company and Mossie Electric Protection Company	8438a	5554
W41a—Excerpts of deposition testimony of Oliver Tyrrell Joy, Notifier Corporation	8438ppp	5584
—Exhibit A	8438jjjjjj	5627
W42a—Excerpts of deposition testimony of Michael Singel, Security Alarm	8440	5631
W43a—Excerpts of deposition testimony of Mary B. Nordsiek, Nordsiek Protection Service	8474	5647
W44a—Excerpts of deposition testimony of Morris J. Amsrud, Suburban Patrol Service Corporation	8491	5652
W45a—Excerpts of deposition testimony of Robert E. Leeper, United States Burglar Alarm Company, Incorporated	8501	5656
W46a—Excerpts of deposition testimony of Victor R. Zahn, Victor Burglar Alarm Company	8569	5684
W47a—Excerpts of deposition testimony of Henry A. Walters, WECO and Ace Alarm Company	8648	5722

[fol. 1351] IN THE UNITED STATES DISTRICT COURT

GOVERNMENT EXHIBIT No. 1
NBFU No. 71

STANDARD

OF THE

National Board of Fire Underwriters

FOR THE INSTALLATION, MAINTENANCE AND USE OF

CENTRAL STATION PROTECTIVE SIGNALING SYSTEMS

for Watchman, Fire Alarm and Supervisory Service

AS RECOMMENDED BY THE

NATIONAL FIRE PROTECTION ASSOCIATION

NATIONAL BOARD OF FIRE UNDERWRITERS
85 John Street, New York 38, N. Y.
222 West Adams Street, Chicago 6, Ill.
465 California Street, San Francisco 4, Calif.

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NBFU No. 71

[fol. 1352]

NOTE

This standard supersedes the edition of June, 1957. Changes from the previous edition, other than editorial, are indicated in the text by vertical lines in the margin. The text, prepared by a Committee of the National Fire Protection Association, is the same as that published in NFPA No. 71, May, 1957.

For standards applying to systems which qualify as proprietary, auxiliary, remote station, and local systems, see NBFU No. 72, Proprietary Protective Signaling Systems.

DEFINITIONS

The word "approved" as used in this standard means acceptable to the authority having jurisdiction. For insurance purposes the authority referred to is the insurance inspection bureau, department or organization having jurisdiction.

The word "shall" indicates provisions which are considered essential for protection of life and property.

The word "should" indicates advisory provisions.

The authority having jurisdiction should be consulted on any questions arising in the application of these standards.

Underwriters' Laboratories, Inc., tests devices and materials for compliance with the standards of construction and performance established by the Laboratories and with regard to their suitability for installation in accordance with the appropriate standards of the National Board of Fire Underwriters. Such devices and materials are listed in the following Laboratories' publications.

Fire Protection Equipment List,
Gas and Oil Equipment List,
Electrical Appliance and Utilization List,
Electrical Construction Materials List,
Hazardous Location Equipment List,
Accident, Automotive, and Burglary Protection Equipment Lists,
Bi-monthly Supplement to All Lists.

Copies may be obtained from inspection departments or from Underwriters' Laboratories, Inc., Chicago, Ill., New York, N. Y., or Santa Clara, Calif.

Many products may be identified by the Laboratories' label, indicating both listing and factory inspection of current output.

A device or system having materials or forms different from those detailed in these standards may be examined and tested according to the intent of the standards and if found equivalent may be approved.

Listings of Signal and Watch Service Appliances appear in the Fire Protection Equipment List.

[fol. 1353]

TABLE OF CONTENTS

Chapter 1. General.

Article		Page
100.	Definitions	3
110.	Fundamentals	4

Chapter 2. Common Requirements.

200.	General	8
210.	Wiring	9
220.	Power Supply Sources	10
230.	Overcurrent Protection	13
240.	Electrical Supervision	13
250.	Signal Capacity of Circuits	15

Chapter 3. Types of Signaling Services.

300.	Manual Fire Alarm Service	16
310.	Watchman's Tour Supervisory Service	16
320.	Automatic Fire Detection and Alarm Service	17
330.	Sprinkler System Waterflow Alarm and Supervisory Signal Service	18
340.	Automatic Smoke Alarm Service	20

792

[fol. 1354]

STANDARD FOR THE INSTALLATION, MAINTENANCE AND USE OF CENTRAL STATION PROTECTIVE SIGNALING SYSTEMS FOR WATCHMAN, FIRE ALARM AND SUPERVISORY SERVICE.

CHAPTER 1. GENERAL.

ARTICLE 100. DEFINITIONS.

Throughout this pamphlet the following meanings are intended:

Alarm Signal. A signal indicating an emergency requiring immediate action, as an alarm for fire from a manual box, a waterflow alarm, an alarm from an automatic fire alarm system, or other emergency signal.

Supervisory Signal. A signal indicating the need of action in connection with the supervision of watchmen, sprinkler and other extinguishing systems or equipment, or with the maintenance features of other protective systems.

Trouble Signal. A signal indicating trouble of any nature, such as a circuit break or ground, occurring in the devices or wiring associated with a protective signaling system.

Protective Systems, Equipment, or Apparatus. Automatic sprinklers, standpipes, carbon dioxide systems, automatic covers, and other devices used for extinguishing fires and for controlling temperatures or other conditions dangerous to life or property.

Protective Signaling Systems. Electrically operated circuits, instruments, and devices, together with the necessary electrical energy, designed to transmit alarms and supervisory and trouble signals, necessary for the protection of life and property.

Central Station System. A system, or group of systems, the operations of which are signaled to, recorded in, maintained and supervised from an approved central station, in which there are competent and experienced observers and operators in attendance at all times whose duty it shall be, upon receipt of a signal, to take such action as shall be required under the rules established for their guidance. Such systems shall be independently owned, controlled, and operated by a person, firm, or corporation whose principal business is the furnishing and maintaining of supervised protective signaling service and who have no interest in the protected properties.

Alarm Service. The service required following the manual operation of a fire alarm box, the transmission of an alarm indicating the operation of protective equipment or systems, such as an alarm from waterflow in a sprinkler system, the discharge of carbon dioxide, the detection of smoke, the detection of excessive heat, or the transmission of an alarm from other protective systems.

Supervisory Service. The service required to assure performance of watch patrols and the operative condition of automatic sprinkler systems and of other systems for the protection of life and property.

Maintenance. Repair service, including periodically recurrent inspections and tests, required to keep the protective signaling system and its component parts in an operative condition at all times, together with replacement of the system or of its components, when for any reason they become undependable or inoperative.

Distant Service. The alarm and supervisory service furnished where, because of distance, customary and acceptable runner and response service cannot be furnished from the central station or from an approved runner station.

ARTICLE 110. FUNDAMENTALS.

1110. Application.

1111. Protective signaling systems have been in use for many years, and their value, in connection with the fire hazard, is recognized as applying both to the protection of life and to the prevention of property damage.

The general experience with all protective signaling systems is that their dependability is directly proportional to the amount and effective character of maintenance, testing, and supervision, and that these functions are best performed when the owner or occupant of the protected premises contracts for service with an outside agency known to be qualified in the handling of central station signaling service.

1112. This Standard is intended to apply primarily to supervisory and alarm service furnished by operators constantly in attendance at a central station, manually or automatically controlled, with the required maintenance, inspection and testing force and runner service readily available. Central station companies customarily follow this Standard for maintenance, testing, and inspection with respect to other classes of contract service which they furnish, but may, subject to approval of the authority having jurisdiction and because of distance from the central station or otherwise, modify the character of the runner service response provided.

For standards applying to systems which do not qualify as central station systems, see Standards for Proprietary, Auxiliary, Remote Station and Local Protective Signaling Systems (NBFU No. 72).

1120. Approval.

1121. Before acceptance may be obtained for any equipment operating through a central station, there shall be filed with the authority having jurisdiction a general description of the apparatus to be installed together with such detailed information and drawings as are necessary to the complete understanding of the operation of the system. Daily reports to subscribers and to the authority having jurisdiction may be required.

1122. If the authority having jurisdiction requires it, there shall also be furnished:

a. Diagrams showing the manner in which the various equip-

ments will be connected to the central station and signals delivered to the city fire department.

b. A satisfactory guarantee of the service to be furnished, and of the efficiency and maintenance of the system.

1130. Central Station Facilities.

1131. The central station building and its fire protection shall be satisfactory to the authority having jurisdiction.

1132. The central station shall be equipped with the necessary instruments of an approved pattern for automatically receiving and recording all signals. The time of receipt of signals shall also be recorded manually, or preferably by an automatic device.

1133. The central station shall have reliable means of transmitting alarms to the fire department over wires electrically supervised and under the control of the central station. Where permissible and deemed necessary it is recommended that there be established a direct electrically supervised circuit to fire alarm headquarters, with suitable code-sending device and recorder, and, in addition, a direct telephone circuit from the central station to fire alarm headquarters.

1134. The devices and circuits shall be designed and installed so as to meet successfully the most severe conditions liable to be met in practice, and no change or alteration shall be made in same without approval.

1135. Circuits between the protected premises and the central station, and within the protected premises, except as hereinafter excluded, where essential to the actuation or operation of signaling devices initiating a signal indicative of fire, shall be so arranged that the occurrence of a single break or single ground fault will not prevent the transmission of an alarm. This requirement shall not apply to circuits wholly within the central station, nor to circuits extending from a thermostat to a transmitter, nor to power supply leads wholly within the buildings protected and carried in metallic conduit not subject to moisture, provided, however, that in the case of each exception failure of the power supply shall give a trouble signal.

1136. The occurrence of a single break or a single ground fault on any circuit shall not of itself cause a false signal which may be interpreted as an alarm of fire. Where such single fault prevents the normal functioning of any circuit its occurrence shall be indicated automatically at the central station by a trouble signal compelling attention and readily distinguishable from signals other than those indicative of an abnormal condition of supervised parts of a fire extinguishing system.

1137. Circuit adjusting means for emergency operation may either be automatic or be provided through manual operation upon receipt of a trouble signal.

1138. The circuits and devices shall be arranged to receive and record a signal readily identifiable as to location of origin, and provisions shall be made for equally identifiable transmission to the fire department.

[fol. 1357]

1140. Operations and Test.

1141. The central station shall have sufficient personnel (a mimimum of two persons) constantly on duty to assure immediate attention to all signals received and, where required, prompt runner service to the protected premises. All operators and runners shall be of mature age.

The authority having jurisdiction may modify the standards respecting personnel where alarms are automatically transmitted to the fire department. Operation and supervision shall be the primary functions of the operators and runners and no other interest or activity shall take precedence over the protective service.

1142. Manual tests of all circuits extending from the central station and of central station devices shall be made at intervals of approximately twelve hours.

1143. Facilities shall be provided at the central station on all circuits extending from the central station and on all local current sources at the central station for making the following tests:

a. Current strength on each circuit; this current to be adjusted to normal before making other tests.

b. Voltage across terminals of each circuit at the inside terminals of protective devices.

c. Voltage between ground and each side of each circuit.

1144. Complete and satisfactory test shall be made monthly of all actuating and transmitting devices, except gate valve supervisory switches, non-coded manual fire alarm boxes, and combination night watch and fire alarm boxes, which must at least be tested at six-month intervals. Test results shall be reported to the authority having jurisdiction.

1150. Signals and Reports.

1151. Arrangements shall be made to furnish reports of signals received to the authority having jurisdiction, in a form acceptable to it.

1152. Disposition of Signals.

a. Upon receipt of trouble signals or other signals pertaining solely to matters of equipment maintenance of the signaling systems, the operating company shall immediately investigate and, if possible, assure that the trouble is remedied at once.

Written notice shall be given the authority having jurisdiction and to the property owner, in all cases where service of the signaling system is interruped and is not immediately corrected.

b. Upon receipt of signals indicating a flow of water in the automatic sprinkler system the central station shall notify the fire department and such other parties as the authority having jurisdiction may require.

It shall also dispatch a runner to the protected premises.

It shall also notify the property owner by telephone or by the quickest method available.

It is recommended that, in addition, written notification be given the property owner.

Where notification is required of parties with whom private lines of communication have not been provided, the quickest available means of communication shall be used.

c. If at any time a combination signal is received which from its nature is indicative of water flow at the premises protected, such a signal shall be handled by the central station as a fire alarm, provided, however, that the authority having jurisdiction may waive notification to the fire department of sprinkler water flow alarms during working hours of the protected premises, unless accompanied by other signals indicating a probable fire. Definite instructions for the handling of alarms shall be posted for the guidance of operators.

d. All alarms initiated by manual or automatic fire alarm devices shall be treated as fire alarms and transmitted to the fire department, and to such other places as may be designated by the authority having jurisdiction.

e. Upon failure of the central station to receive a watchman's regular signal within the grace period established the central station shall at once communicate with the protected premises by telephone, or by calling back over the system circuit. If communication cannot be established promptly a runner shall be dispatched to investigate the delinquency. Failure of the watchman to follow a prescribed route in transmitting his signals shall be handled as a delinquency and reported in writing to the authority having jurisdiction. All delinquencies shall be reported in writing to the subscriber.

f. Sprinkler system and other supervisory signals shall be communicated immediately to a designated person at the protected premises, and shall be investigated by a runner unless supervised conditions are restored to normal promptly. The authority having jurisdiction and the subscriber shall be notified of the signal and of the times of occurence and restoration of service. Notification shall be given the fire department and others designated by the authority having jurisdiction when sprinkler systems are wholly or partially out of service.

g. The operating company shall have a man available within two-hour travel who is competent to inspect, maintain, and repair the system.

1153. Distant Service. Where, because of distance, acceptable runner service cannot be furnished from the central station or from an approved runner station, the authority having jurisdiction shall designate the method of handling alarm and other signals and the runner service to be provided.

It is recommended that, where practicable, suitable provision be made, subject to the acceptance of the authority having jurisdiction, to notify the local fire department or brigade of alarms, either by automatic or manual transmission from the protected premises or from the central station, such provision to include confirmation of the alarm from the central station to the local fire department by telephone or by coded signal.

[fol. 1359]

CHAPTER 2. COMMON REQUIREMENTS.

ARTICLE 200. GENERAL.

2010. Scope.

2011. The intent and meaning of the terms used in this standard are, unless otherwise defined herein, the same as those of the National Electrical Code.

2020. Approval.

2021. At the request of the authority having jurisdiction, complete information regarding the system including specifications, wiring diagrams, and floor plans shall be submitted for approval prior to installation of equipment or wiring.

2022. All devices, combinations of devices, and equipment constructed and installed in conformity with this standard shall be approved for the purposes for which they are intended.

2023. Upon completion of a system, a satisfactory test shall be made in the presence of a representative of the authority having jurisdiction.

2024. All systems shall be under the supervision of qualified persons satisfactory to the authority having jurisdiction; these persons shall cause proper tests and inspections to be made at frequent intervals and shall have general charge of all alterations and additions to the systems under their supervision.

2025. A complete record shall be kept of the tests and operations of each system and the records shall be open to examination by the authority having jurisdiction.

2030. Installation and Design.

2031. All systems shall be installed in a workmanlike manner and in accordance with the specifications and standards approved by the authority having jurisdiction.

2032. Devices shall be so located and mounted that accidental operation will not be caused by vibration or jarring.

2033. All systems shall test free of grounds except parts of circuits or equipment which are intentionally and permanently grounded to provide ground fault detection, emergency ground signaling, or circuit protective grounding. All systems shall be so designed that they do not depend upon the effectiveness of any ground connection for normal operation.

2034. A system shall be so designed and installed that it shall be capable of performing its intended function at 80 per cent and at 110 per cent of the rated voltage.

2035. All apparatus requiring rewinding or resetting to maintain normal operation shall be restored to normal as promptly as possible after each test or alarm, and kept in normal condition for operation.

2036. A coded alarm signal shall consist of not less than three complete rounds of the number transmitted.

ARTICLE 210. WIRING

2110. General.

2111. The provisions of this Article apply to installation wiring for interconnecting system components.

2112. Fire-protective signaling circuits, at multiple circuit terminal and junction locations where circuits for other purposes are present, shall be marked for identification or so protected as to avoid interruption of service due to short-circuiting or other conditions of testing and servicing which might affect adversely the connected fire-protective signaling equipment.

2120. Exposure.

2121. Insulation. The insulation materials of conductors and cables shall be suitable for the normal conditions to which they are exposed in service.

2122. Wiring, cables, and terminal and junction facilities, unless adequately protected, shall be located where they are not exposed to hazardous or corrosive atmospheres, stored combustible materials, or to other potential hazards which might cause disruption of service.

Outside Wiring.

2130. Circuits.

2131. Wiring circuits reserved solely for fire-protective signaling services and complying with the requirements of the National Electrical Code for communication circuits are acceptable for outside wiring.

2132. To secure the greatest measure of protection and dependability in the operation of protective signaling systems, it is recommended that all wires outside buildings be placed underground.

Inside Wiring

2140. General.

2141. All inside wiring shall be in conformity with the requirements of the National Electrical Code for Class 1 signal systems except as otherwise indicated in this Article, or other Articles, of this Standard.

2150. General Circuit Cables.

2151. Cable approved for the purpose may be used as a method of wiring for general circuits operating at 150 volts or less.

2152. Cable for use for general circuits operating at 150 volts or less shall be constructed as follows:

a. Conductors shall be of solid copper, not less than No. 14 AWG for single- and two-conductor cables, not less than No. 18 AWG for three- and four-conductor cables, and not less than No. 22 AWG for cables having more than four conductors.

b. The individual conductors shall have rubber or thermoplastic insulation having a nominal thickness of not less than 1/32 inch.

c. The cable conductors shall have a lead sheath or a moisture-resistant and flame-retardant jacket providing equivalent protection against mechanical injury to that obtained with non-metallic sheathed cable described in the National Electrical Code.

2160. **Limited Energy Fire Detector Circuit Cables.**

2161. Special cable may be used for limited-energy fire detector circuits where the following conditions exist:

a. The open circuit voltage does not exceed 50 volts.

b. Overcurrent protection of not more than 2-amperes rating is provided. A fuse used for this purpose shall be of non-interchangeable type. If the current is taken from a transforming device having energy-limiting characteristics, the fuse may be omitted.

c. The capacity of the supply circuit is limited in its maximum rated output to 100 volt-amperes.

2162. Conductors of a cable for use with limited-energy circuit shall be of solid copper not smaller than No. 22 AWG and shall have thermoplastic insulation of not less than 0.012 inch nominal (0.010 inch minimum) thickness. The cabled conductors shall have a thermoplastic jacket over-all having a nominal thickness of not less than 0.035 inch (0.030 inch minimum). Two-conductor assemblies may be in flat parallel construction with 1/32 inch nominal integral-insulation jacket and an 0.047 inch minimum web. Approved low-energy circuit cable may be used. Other insulation having equivalent performance characteristics may be acceptable.

2170. **Cable Installation.**

2171. The cables described in Sections 2150 and 2160 may be installed exposed on ceilings, and on side walls if not less than 7 feet from the floor, if adequately protected against injury. Concealed cable and cable passed through floors or located on side walls within 7 feet of the floor shall be installed in conduit or other approved raceway. Cable shall be supported and terminated in approved fittings.

2180. **Line Thermostats.**

2181. Line type thermostats, including insulated copper tubing of pneumatically-operated detectors employed for both detection and current-carrying purposes, shall be installed in conformity with paragraph 2171 and shall provide adequate insulation for the voltage applied to the thermostat. (see paragraph 2162).

ARTICLE 220. POWER SUPPLY SOURCES.

2210. **General.**

2211. The method of supplying power to a central station system shall be subject to the permission of the authority having jurisdiction and to the requirements of these standards.

2212. The equipment shall be approved for the particular application.

2213. All power supply equipment (batteries, battery-chargers rectifiers, switching facilities, transformers, voltage regulators, etc.) and wiring shall be installed in conformity with the requirements of the National Electrical Code for such equipment, except as otherwise permitted in this standard.

[fol. 1362]

2214. Two alternate main power supply sources shall be provided within the central station. The secondary source shall be independent of other sources and of a high degree of reliability. The secondary source shall be arranged as follows:

a. It shall not operate through or be dependent upon the same motor generator, converter, or other device having moving parts which supplies the primary or normal supply, except that no additional source of power is required when a storage battery floating on a rectifier or generator is employed.

b. It shall be of such capacity and reliability as to assure operation in case of interruption of the normal supply.

c. It shall automatically supply the circuit or circuits upon loss of the normal source within 30 seconds; this automatic feature may be omitted if suitable provisions are made for manually restoring service within 30 seconds.

d. The secondary source may be used for trouble signal power supply.

2220. Storage Batteries.

2221. Storage batteries shall be so located or enclosed that the equipment of the signaling system, including overcurrent protective devices, will not be adversely affected by battery gases.

2222. Cells shall be suitably insulated against grounds and crosses and shall be substantially mounted in such a manner as not to be subject to mechanical injury. Racks and frames shall be suitably protected against deterioration.

2223. A reliable source of power supply of not more than 250 volts shall be provide for charging the batteries. Where the record of continuity of the supply source makes it desirable two separate, independent sources of supply shall be provided.

2224. The battery shall be protected by over-current devices having a rating of not less than 150 per cent and not more than 200 per cent of the maximum operating load applied to the battery.

2225. Suitable provisions on a switchboard shall be made for charging the batteries so that they will be protected from injury due to an excessive rate of charge or to the reversal or interruption of supply current. Provision shall also be made for shifting the respective batteries from charging to working and from working to charging without opening any of the working circuits and so that the charging current cannot be accidentally connected to any of the working lines.

2226. Where batteries are cycle-charged duplicate sets shall be employed, each set capable of operating the system under the maximum normal load condition without recharging for not less than sixty consecutive hours.

2227. Where trickle-charged the battery shall be capable of operating the system under the maximum load condition for not less than twenty-four consecutive hours with the power supply to the charger disconnected. Adequate facilities shall be provided to maintain the battery fully charged under all conditions of normal

operation. If a rectifier is used for charging it shall be energized by an insulating transformer having a supply circuit of not more than 250 volts. Provisions shall be made to prevent spraying the electrolyte of the battery while the battery is being charged at the maximum rate permitted by its charging source.

2230. Motor-Generators.

2231. A motor-generator set shall be used only where an operator is on duty at all times. Power for operating the motor-generator shall be available from not less than two independent sources of energy, one of which may be a special generator plant driven from some form of prime mover continuously available.

2240. Electric Light or Power Service.

2241. Where experience with commercial light or power service continuity is satisfactory such sources may be used to supply signal initiating circuits at the protected premises, subject to the acceptance of the authority having jurisdiction and provided that failure of the service source results in the transmission of a trouble signal to the central station. Connection to the commercial light or power service shall be made on the house side of the main meter but ahead of all control switches so located. A circuit disconnecting means shall be so installed that it will be accessible only by authorized personnel. Transformers and other devices used in such an application shall be expressly approved for the purpose.

2250. Rectifiers.

2251. A rectifier employed as a direct source of supply shall be approved for the purpose and of adequate capacity to maintain voltage regulation between 130 per cent of rated voltage at no load and 100 per cent of rated voltage at maximum load. Power shall be available from not less than two independent sources of energy, one of which may be a special generator plant driven from some form of prime mover continuously available.

2260. Primary Batteries.

2261. A primary battery shall not be used as the main operating supply of a signaling system or for any purpose other than as a source of energy for operating trouble signal devices, as an emergency auxiliary source of supply temporarily in the event of interruption of the main operating supply, or as a source of supply for a normally closed low-current circuit (10 milliamperes maximum) where depreciation of battery potential results in a trouble signal when the circuit becomes inoperative.

2262. Primary batteries shall be located not less than 6 inches nor more than 6 feet above the floor in a clean dry place where the ambient air temperature will not be less than 40° F. and not more than 100° F.

2263. Primary batteries shall be housed in a locked substantial enclosure or otherwise suitably protected against movement, injury, and moisture. Reliable separation between cells shall be provided

to prevent contact between terminals of adjacent cells and between battery terminals and other metal parts which may result in depletion of the battery or other deterioration.

2264. Battery cells having containers constructed of other than suitable electrical insulating material shall be located on insulating supports.

2265. Battery cells shall be interconnected by suitable connectors.

2266. Each primary battery shall be inspected and tested to determine its terminal voltage while supplying the maximum load permitted by its application at least once each month. The battery shall be replaced when this voltage indicates its minimum rated discharge voltage.

2267. The maximum normal load of a primary battery shall not be more than 2 amperes per cell.

2268. A primary battery shall have sufficient capacity to supply 125 per cent of the maximum normal load for not less than one year.

2269. a. An individual dry battery cell rated 1½ volts (No. 6 size) shall be replaced when its short-circuit current is less than ten amperes or when a load of one ohm reduces the potential below one volt.

b. A unit assembly of dry battery cells rated 6 volts shall be replaced when a load of four ohms reduces the potential of the unit below four volts.

ARTICLE 230. OVERCURRENT PROTECTION.

2310. General.

2311. Overcurrent protection shall be provided for central station protective signaling systems in accordance with the requirements of pars. a. through c.

a. Batteries. See par. 2224.

b. Conductors shall be protected in accordance with their rated current-carrying capacities as established by the National Electrical Code.

c. Transformers shall be protected on either the primary or secondary side by overcurrent devices having a rating not greater than the continuous duty rating of the transformer, unless the current is limited to the same value by other approved means.

ARTICLE 240. ELECTRICAL SUPERVISION.

2410. General.

2411. Except as otherwise permitted in this standard a system shall be electrically supervised so that the occurrence of a break or a ground fault condition in its installation-wiring circuits or in the circuits between the central station and the protected premises which

[fol. 1365]

prevents the normal operation of the system, or failure of the main power supply source, will be indicated at the central station by a distinctive trouble signal.

2420. Power Supply Circuit Supervision.

2421. The electrical supervision shall include all sources of energy except the following secondary sources:

a. One employed for the operation of trouble signal circuits and appliances.

b. One employed as an auxiliary means for maintaining normal operation of the system following trouble signal indication when the main supply source is interrupted.

c. One employed as a means of operating a supplementary circuit for alarm bells, annunciators, time stamps, and similar circuits, the failure of which will not prevent reception of required signals.

d. The battery leads of a trickle-charged battery.

e. The neutral of a three-, four-, or five-wire a.c. or d.c. supply source.

2430. Signal-Initiating Circuits.

2431. The electrical supervision shall also include all circuits for signals initiated by the operation of fire alarm boxes, fire detectors, automatically operated transmitters, or other appliances or devices which initiate or transmit signals either manually or automatically except:

(a) A non-interfering shunt circuit, provided that a fault condition of the shunt circuit wiring results only in the loss of the non-interfering feature of operation.

(b) The circuits of a supplementary signal annunciator, provided that the fault condition of this circuit results only in the loss of annunciation.

2440. Exceptions to Electrical Supervision.

2441. In the central station, where personnel responsible for supervision and operation of the system are on duty continuously, the following features or facilities located in the station need not be electrically supervised:

a. The station circuits for alarm bells and registers which are controlled by devices which have their operating circuits electrically supervised.

b. Main power supply, if the fault condition is otherwise so indicated as to be obvious to the operator on duty.

2442. Electrical supervision need not be provided for:

a. A supplementary circuit for operating fan motor stops or similar industrial control equipment intended to be actuated at the time of the alarm signal, provided a fault condition of such a supplementary circuit in no way affects the normal operation of the signaling system.

[fol. 1366]

JULY, 1959 AMENDMENTS

to the July, 1958 Standards
of the National Board of Fire Underwriters for the
Installation, Maintenance and Use of

CENTRAL STATION
PROTECTIVE SIGNALING SYSTEMS

for Watchman, Fire Alarm and Supervisory Service

NBFU No. 71

as recommended by the
National Fire Protection Association

Note: With these amendments, the text is the same as that published in NFPA No. 71, June 1959.

2512. *Add new paragraph as follows:*

2512. The number of waterflow switches which may be connected to actuate a single transmitter shall not exceed five, and the number of supervisory switches which may be connected to actuate a single transmitter shall not exceed twenty.

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85 John Street, New York 38, N. Y.
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465 California Street, San Francisco 4, Calif.

b. A circuit employed to produce a supplementary local alarm signal, provided that the occurrence of the fault on such a circuit in no way affects the transmission of an alarm signal to the central station.

c. Thermostats or the detectors of a metallic tubing automatic fire alarm system where the wiring terminals of such devices are connected in multiple across electrically supervised circuits.

2450. Trouble Signals.

2451. Trouble signals shall be of a type and so located as to be acceptable to the authority having jurisdiction. Preferably trouble signals shall be located at the central station.

ARTICLE 250. SIGNAL CAPACITY OF CIRCUITS.

2510. General.

2511. The number of signal transmitting devices connected to any signaling circuit shall be limited to avoid interference. The total number of code wheels connected to a single circuit shall not exceed two hundred fifty. It is recommended that alarm signal transmitting devices be connected to circuits reserved solely for alarm signals.

2520. Combined Alarm and Supervisory Signal Circuits.

2521. When both sprinkler supervisory signals and fire or waterflow alarm signals are transmitted over the same signaling circuit, provision shall be made to obtain either alarm signal precedence or sufficient repetition of the alarm signal to prevent the loss of any alarm signal.

2530. Combined Waterflow Alarm and Manual Fire Alarm Circuits.

2531. When signals from manual fire alarm boxes and waterflow alarm signaling devices within a building are transmitted over the same signaling circuit, there shall be no interference with the fire box signals when both types of signaling devices are operated at the same time. Provision of the shunt non-interfering method of operation is acceptable for this performance.

2540. Loading Capacity of Alarm Circuits.

2541. One signaling circuit shall serve not more than twenty-five plants.

Note: A plant may consist of one or more buildings under the same ownership and the circuit arrangement shall be such that an alarm signal will not be received from more than one transmitting device within a plant at a time. If such non-interference is not provided each building shall be considered a plant.

2550. Loading Capacity of Sprinkler Supervisory Signal Circuits.

2551. One signaling circuit may serve not more than twenty-five plants.

Note: A plant may consist of one or more buildings under the same ownership.

[fol. 1368]

2560. Loading Capacity of Watch Supervisory Signal Circuits.

2561. Connections to a watch supervisory signal circuit, or to a combination manual fire alarm and watch signal circuit, shall be so limited that not more than sixty scheduled watch report signals will be transmitted in any one-hour period. Patrol scheduling shall be such as to avoid interference between watch report signals.

CHAPTER 3. TYPES OF SIGNALING SERVICES.

ARTICLE 300. MANUAL FIRE ALARM SERVICE.

3010. Fire Alarm Boxes.

3011. General. Manual fire alarm boxes shall be used only for fire protective signaling purposes. Combination fire alarm and watchman's signaling boxes are acceptable.

3012. Mounting. Each station shall be securely mounted. It is recommended that the bottom of each station be not less than 4½ feet and not more than 6 feet above the floor level.

3013. Distribution. Manual fire alarm boxes shall be distributed throughout the protected area so that they are unobstructed, readily accessible, and located in the normal path of exit from the area, and as follows:

a. One box shall be provided on the first floor and on each succeeding alternate floor, except that one box shall be provided for each floor where the maximum fire area is 10,000 square feet or more.

b. Additional boxes shall be provided on each floor to obtain a maximum horizontal travel distance of 200 feet to the nearest box.

3014. Coded Signal Designations. A coded fire alarm box shall produce not less than three signal impulses for each revolution of the coded signal wheel.

Note: The following suggested coded signal assignments for a building having four floors and basements are provided as a guide:

Location	Coded Signal
4th Floor	2-4
3rd Floor	2-3
2nd Floor	2-2
1st Floor	2-1
Basement	3-1
Sub-basement	3-2

ARTICLE 310. WATCHMAN'S TOUR SUPERVISORY SERVICE.

3110. General.

3111. The number of watchman's reporting stations, their locations, and the route to be followed by the watchman for operating the stations shall be approved for the particular installation.

3112. A permanent record indicating each time each signal transmitting station is operated shall be made at the central station. When intermediate stations which do not transmit a signal are employed in conjunction with signal transmitting stations, distinctive signals shall be transmitted at the beginning and end of each tour of a watchman and a signal transmitting station shall be provided at intervals not exceeding ten stations. Intermediate stations which do not transmit a signal shall be capable of operation only in a fixed order of succession.

3113. Stations which transmit a signal only when not operated within a prescribed time interval may be used as intermediate stations where a fixed route is not considered necessary to assure complete watch service.

ARTICLE 320. AUTOMATIC FIRE DETECTION AND ALARM SERVICE.

3210. General.

3211. Automatic fire alarm systems shall be arranged to transmit a signal designating the building protected, and shall also indicate, either in the signal or by approved visual means in or at the building, the floor, section or subdivision from which the signal originated, except that the authority having jurisdiction may, upon application, waive this specific indication where the area, height or special conditions of occupancy are such that this indication is not deemed to be an essential feature of alarm protection of the property.

3220. Supplementary Manual Alarm Signal.

3221. It is recommended that supplementary means for manually operating an automatic fire alarm system be provided, located where designated by the authority having jurisdiction.

3230. Location of Detecting Equipment.

3231. Fire detecting equipment shall be located upon the ceiling or on the side walls not more than 20 inches below the ceiling. It shall be installed throughout all parts of the protected premises including all rooms, halls, storage areas, basements, attics, lofts, and other subdivisions and accessible spaces; and inside all closets, elevator shafts, enclosed stairways, dumb-waiter shafts, chutes, and other minor subdivisions and enclosures.

3232. For the purposes of this section the area underneath a deck, mezzanine, or floor landings of stairways having a minor dimension of four (4) feet or more shall be considered a separate subdivision and shall be protected accordingly.

3233. Protection may be required under large benches, shelves, or tables, inside cupboards or other enclosures not extending to the ceiling, and under open loading docks or platforms and their covers, and in accessible underfloor spaces of buildings without basements.

3234. Where codes, standards, laws or authorities having jurisdiction require the protection of selected areas only, the specified areas shall be protected in accordance with these standards.

3235. High Temperature Areas. Special instructions shall be obtained from the authority having jurisdiction respecting the use of high-temperature degree thermostats in boiler rooms, heating boxes, skylights, etc.

3236. Detector Spacing. Detector spacings shall not exceed the linear maximums indicated in Underwriters' Laboratories, Inc., Fire Protection Equipment List for the particular device used. Closer spacing may be required due to structural characteristics of the protected area, possible drafts, or other conditions affecting detector operation. Spacing of thermostats at right angles to solid joists should be reduced 50 per cent.

3237. Thermostat Mounting. Thermostats shall be supported in all cases independently of their attachment to the wires.

3238. Tests. Fire detectors shall be tested periodically as specified by the authority having jurisdiction.

ARTICLE 330. SPRINKLER SYSTEM WATERFLOW ALARM AND SUPERVISORY SIGNAL SERVICE.

3310. Scope.

3311. These standards are equally applicable to extinguishment systems using gases or fluids other than water.

3320. General.

3321. Supplementary Manual Alarm Signal. It is recommended that supplementary means be provided for manually transmitting an alarm signal, located where designated by the authority having jurisdiction.

3322. Supplementary Pressure Supervisory Signal. It is recommended that a dry pipe sprinkler system equipped for waterflow alarm signals only provide supplementary supervision of the system air pressure to avoid false alarm signals resulting from neglect in maintaining air pressure. Connection of the pressure supervisory signal attachment contacts to obtain trouble signal operation of the transmitter used for waterflow alarm signals is acceptable for this purpose.

3323. Signal Identification. Signals transmitted shall indicate distinctively the particular element of the automatic sprinkler system which is abnormal and its restoration to a normal condition.

3324. Tampering. A signal attachment and its circuits shall be so designed and installed that they cannot be readily tampered with or removed without causing a signal to be produced.

3330. Waterflow Alarm Service.

3331. Provision shall be made to indicate the flow of water in a sprinkler system, except movement due to waste, surges, or variable pressure, by an alarm signal at the central station. The waterflow signaling attachment shall operate to indicate a leak or flow of water in excess of ten gallons per minute. The central station waterflow

alarm attachment shall not be dependent upon or affected by interference of attachments used or intended to be used in connection with a local waterflow alarm system.

3340. Supervisory Signal Service.

3341. General. Provision shall be made for supervising the required conditions essential to the proper operation of sprinkler systems, except those related to water mains, tanks, cisterns, reservoirs and other containers of water controlled by a municipality or a public utility.

3342. Gate Valve Position Supervision. A gate valve shall be supervised to obtain two separate and distinct signals, one indicating movement of the valve from its normal position and the other indicating restoration of the valve to its normal position. The off-normal signal shall be obtained either during the first two revolutions of the hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position. An attachment for supervising the position of a gate valve shall not interfere with the operation of the valve nor obstruct the view of its indicator nor prevent access to its stuffing box.

Note: Where the signaling attachments of two or more valves utilize a common circuit a restoration signal shall be obtained only when all of the valves of the group are in their normal positions.

3343. Pressure Supervision. Pressure sources shall be supervised to obtain two separate and distinct signals, one indicating that the required pressure has been increased or decreased and the other indicating restoration of the pressure to its required value.

a. A pressure supervisory signal attachment for a pressure tank shall indicate both high and low pressure conditions. A signal shall be obtained when the required pressure is increased or decreased ten pounds from the required pressure value.

b. A pressure supervisory signal attachment for a dry pipe sprinkler system shall indicate both high and low pressure conditions. A signal shall be obtained when the required pressure is increased or decreased in accordance with the requirements of the authority having jurisdiction.

c. A steam pressure supervisory attachment shall indicate a low-pressure condition. A signal shall be obtained when the required pressure is reduced to a value which is not less than 110 per cent of the minimum operating pressure of the steam-operated equipment supplied.

d. An attachment for supervising the pressure of other sources than those specified above shall be capable of being applied and operated as required by the authority having jurisdiction.

3344. Water Level Supervision. Water storage containers shall be supervised to obtain two separate and distinctive signals, one indicating that the required water level has been lowered or increased and the other indicating restoration to the required level.

a. A high pressure tank supervisory attachment shall indicate both high and low level conditions. A signal shall be obtained when the water level is lowered or raised three inches from the required level.

b. A supervisory attachment for other than pressure tanks shall indicate a low level condition. A signal shall be obtained when the water level is lowered 12 inches from the required level.

3345. Water Temperature Supervision. Exposed water storage containers shall be supervised to obtain two separate and distinctive signals, one indicating that the temperature of the water has been lowered to 40° F., and the other indicating restoration to a proper temperature.

3346. Pump Supervision. Automatic fire pumps, auxiliary booster and special service pumps shall be supervised as required by the authority having jurisdiction.

ARTICLE 340. AUTOMATIC SMOKE ALARM SERVICE.

3410. General.

3411. The authority having jurisdiction shall be consulted in all cases before installation of equipment.

3420. Signal Indication.

3421. Abnormal smoke density shall result in transmission of a distinctive smoke alarm signal to the central station. The signal transmitted shall designate the building protected. The floor, section or subdivision of the building at which the signal originated shall be indicated also, either by the signal to the central station or by approved visual means in or at the building when the condition of occupancy and application of smoke detection are such that this feature is essential for adequate protection.

3422. Smoke alarm service may include provision for connection of a supplementary circuit for actuation of equipment controlling blowers, fans, shutters, etc., at the time of a smoke alarm signal.

3430. Location of Detectors.

3431. Smoke detectors shall be so located and adjusted to operate reliably in case of smoke at any part of the area protected. The location of detectors should be based upon an engineering survey of the application of this form of protection to the area under consideration. These features include air velocity; number of detectors to provide adequate coverage of cross-sectional areas of the space with respect to travel, diffusion, or stratification of smoke; location of detectors with respect to exhaust intake, or circulating blowers; air conditioning facilities; temperature variations, and the like. Such conditions vary with different installations and should be dealt with on the basis of experience in the service.

3432. Special consideration shall be given to the storage of contents of a protected space to provide unobstructed openings for the travel of smoke to the smoke detector.

[fol. 1373]

3433. Where air conditioning or ventilating equipment serves the space to be protected by a smoke detector, particular attention shall be given to the intake, exhaust, and circulation of smoke under any condition of operation of the equipment to insure prompt detection.

3434. Photo-electric light beams shall be so located or enclosed or otherwise arranged that movement of objects within the space protected will cause no signal.

3435. Light-sensitive equipment shall be so located or shielded that light from any source other than that intended to be applied to the equipment will have no effect upon the detector. The opening of any enclosure during normal servicing shall cause no smoke alarm signal. A smoke detector shall be so installed as to minimize the possibility of operation due to accumulation of dust, moisture, deterioration of equipment, or any other condition of system operation not associated with fire or smoke.

3436. The conditions of occupancy of each space protected by a smoke detector shall be arranged to avoid operation of the detector due to the use of fumigants, or any other type of fog- or mist-producing materials, sweeping and cleaning resulting in dust circulation, or the like.

3437. The smoke detection combination shall be able to withstand 110 per cent of the rated voltage continuously without injury during the normal supervisory condition and shall operate successfully during the normal signaling condition at the increased voltage and also at 80 per cent of normal voltage.

3438. All smoke detecting equipment shall be secured reliably in place. The security of separate photo-electric light source and receiver units shall insure against change of adjustment due to vibration, change in alignment of supporting surfaces, or the like.

3439. Provision shall be made to afford adequate protection of the smoke detection equipment from mechanical injury.

3440. Maintenance Servicing.

3441. All equipment requiring servicing shall be readily accessible and shall provide practical means for cleaning parts which accumulate dust, replacement of illuminating lamps, etc.

3442. Suitable and practical facilities shall be provided to permit periodic testing for sensitivity.

3443. The equipment shall be inspected monthly and maintained in proper operating condition.

3450. Circuit Arrangement.

3451. A smoke detecting combination shall be capable of operating for a smoke alarm signal during a single break or a single ground fault condition of the circuit wiring conductors (a) between the central station and the smoke alarm signal transmitter and (b) between the smoke alarm signal transmitter and the smoke detector control unit, except as indicated in paragraph 3452.

[fol. 1374]

3452. The requirement of paragraph 3451 does not apply to the circuits between the smoke alarm signal transmitter and the smoke detector control unit if both of these units are located in a common enclosure, or in adjacent enclosures not more than three feet apart and having the circuits between the enclosures run in conduit.

3453. The motor of a blower provided as a part of a smoke detector shall be electrically supervised to indicate stalling or burnout.

3454. The requirements of Article 240 for electrical supervision of circuits applies to all wiring employed to interconnect separate units of a smoke detecting system and its power supply circuit wiring at the installation. In addition, the smoke detecting system shall provide electrical supervision of all filaments of photo-electric cell illuminating lamps and the filaments and heaters of all electronic tubes, if their failure prevents normal operation for a smoke alarm signal.

3455. The failure of electrically-supervised circuits and parts shall be indicated by a trouble signal which is distinctive from a smoke alarm signal.

[fol. 1375] IN THE UNITED STATES DISTRICT COURT

GOVERNMENT EXHIBIT No. 2
NBFU No. 72

NBFU No. 72

STANDARD

OF THE

National Board of Fire Underwriters

FOR THE INSTALLATION, MAINTENANCE AND USE OF

PROPRIETARY,

Auxiliary, Remote Station, and Local

PROTECTIVE SIGNALING SYSTEMS

for Watchman, Fire Alarm and Supervisory Service

AS RECOMMENDED BY THE

NATIONAL FIRE PROTECTION ASSOCIATION

NATIONAL BOARD OF FIRE UNDERWRITERS
85 John Street, New York 38, N. Y.
222 West Adams Street, Chicago 6, Ill.
465 California Street, San Francisco 4, Calif.

JULY, 1958

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[fol. 1376]

NOTE

This standard supersedes the edition of July, 1956 and amendments of June, 1957. Changes from the previous edition, other than editorial, are indicated in the text by vertical lines in the margin. The text, prepared by a Committee of the National Fire Protection Association, is the same as that published in NFPA No. 72.

For standards applying to systems which qualify as central station systems, see N.B.F.U. No. 71, Central Station Protective Signaling Systems.

DEFINITIONS

The word "approved" as used in this standard means acceptable to the authority having jurisdiction. For insurance purposes the authority referred to is the insurance inspection bureau, department or organization having jurisdiction.

The word "shall" indicates provisions which are considered essential for protection of life and property.

The word "should" indicates advisory provisions.

The authority having jurisdiction should be consulted on any questions arising in the application of these standards.

Underwriters' Laboratories, Inc., tests devices and materials for compliance with the standards of construction and performance established by the Laboratories and with regard to their suitability for installation in accordance with the appropriate standards of the National Board of Fire Underwriters. Such devices and materials are listed in the following Laboratories' publications.

Fire Protection Equipment List
Gas and Oil Equipment List
Electrical Construction Materials List
Electrical Appliance and Utilization Equipment List
Hazardous Location Equipment List
Accident, Automotive, and Burglary Protection Equipment Lists
Bi-Monthly Supplement to All Lists.

Copies may be obtained from inspection departments or from Underwriters' Laboratories, Inc., Chicago, New York or Santa Clara, Calif.

Listings of Signal and Watch Service Appliances appear in the Fire Protection Equipment List.

Many products may be identified by the Laboratories' label, indicating both listing and factory inspection of current output.

A device or system having materials or forms different from those detailed in these standards may be examined and tested according to the intent of the standards and if found equivalent may be approved.

[fol. 1377]

TABLE OF CONTENTS

Chapter 1. General.

Article		Page
100.	Definitions	3

Chapter 2. Common Requirements.

200.	General	5
210.	Wiring	6
220.	Power Supply Sources	8
230.	Overcurrent Protection	11
240.	Electrical Supervision	11
250.	Audible Signaling Appliances	13
260.	Signal Capacity of Circuits	14

Chapter 3. Types of Signaling Services.

300.	Scope	15
310.	Manual Fire Alarm Service	15
320.	Watchman's Tour Supervisory Service	15
330.	Automatic Fire Detection and Alarm Service	16
340.	Sprinkler System Waterflow Alarm and Supervisory Signal Service	17
350.	Automatic Smoke Alarm Service	19

Chapter 4. Types of Systems.

400.	Proprietary Systems	21
420.	Auxiliary Fire Alarm Systems	25
430.	Remote Station Fire Alarm Systems	27
440.	Local Systems	28
450.	Miscellaneous Systems	29

[fol. 1378]

STANDARD FOR THE INSTALLATION, MAINTENANCE AND USE OF PROPRIETARY, AUXILIARY, REMOTE STATION AND LOCAL PROTECTIVE SIGNALING SYSTEMS INCLUDING LOCAL OR ISOLATED SYSTEMS FOR WATCHMAN, FIRE ALARM AND SUPERVISORY SERVICE.

CHAPTER 1. GENERAL.

ARTICLE 100. DEFINITIONS.

Throughout this pamphlet the following meanings are intended:

Alarm Signal. A signal indicating an emergency requiring immediate action, as an alarm for fire from a manual box, a waterflow alarm, an alarm from an automatic fire alarm system, or other emergency signal.

Supervisory Signal. A signal indicating the need of action in connection with the supervision of watchmen, sprinkler and other extinguishing systems or equipment, or with the maintenance features of other protective systems.

Trouble Signal. A signal indicating trouble of any nature such as a circuit break or ground, occurring in the devices or wiring associated with a protective signaling system.

Protective Systems, Equipment or Apparatus. Automatic sprinklers, standpipes, carbon dioxide systems, automatic covers, and other devices used for extinguishing fires and for controlling temperatures or other conditions dangerous to life or property.

Protective Signaling Systems. Electrically operated circuits, instruments, and devices, together with the necessary electrical energy, designed to transmit alarms and supervisory and trouble signals, necessary for the protection of life and property.

Alarm Service. The service required following the manual operation of a fire alarm box, the transmission of an alarm indicating the operation of protective equipment or systems, such as an alarm from waterflow in a sprinkler system, the discharge of carbon dioxide, the detection of smoke, the detection of excessive heat, or the transmission of an alarm from other protective systems.

Supervisory Service. The service required to assure performance of watch patrols and the operative condition of automatic sprinkler systems and of other systems for the protection of life and property.

Maintenance. Repair service, including periodically recurrent inspections and tests, required to keep the protective signaling system and its component parts in an operative condition at all times, together with replacement of the system or of its components, when for any reason they become undependable or inoperative.

[fol. 1379]

Proprietary System. A system with supervision by competent and experienced personnel in a central supervising station at the property protected. The system is to include equipment and other facilities required to permit the operators to maintain, test, and operate the system, and upon receipt of a signal, to take such action as shall be required under the rules established for their guidance by the authority having jurisdiction.

(See Paragraph 4011 for a statement of the distinction between Class A and Class B Proprietary Systems).

Auxiliary Alarm System. A system maintained and supervised by a responsible person or corporation and consisting of transmitting devices and associated equipment which when operated manually or automatically causes an alarm to be transmitted over a municipal fire alarm system, to a fire station or to fire alarm headquarters for retransmission, either manually or automatically, to fire stations.

Auxiliarizing a municipal fire alarm system in connection with a private fire alarm system has for its object the transmission of alarms directly to a fire station or to fire alarm headquarters upon operation of an actuating device such as an automatic fire detector, waterflow alarm switch, or manual fire alarm station. Combining the auxiliary feature with any private alarm system introduces features of maintenance, inspection, and supervision, usually involving divided authority, and requires special consideration by the authority having jurisdiction. Fire alarm systems which transmit an alarm to a fire station or to fire alarm headquarters, independently of and in addition to an auxiliary system, provide a duplication of service, increasing the probability of an alarm being received.

There are two types of auxiliary systems, the series or local current type, and the shunt type.

Remote Station System. A system of electrically supervised devices employing a direct circuit connection between the alarm signal actuating devices at the protected premises and signal-indicating equipment in a remote station, such as fire or police headquarters or other place acceptable to the authority having jurisdiction.

Local Alarm System. An electrically operated system producing signals at one or more places at the premises served.

Miscellaneous System. Any other protective signaling system.

CHAPTER 2. COMMON REQUIREMENTS.

ARTICLE 200. GENERAL.

2010. Scope.

2011. The provisions of this Chapter apply to all fire-protective signaling systems covered by these standards except as otherwise indicated in other sections.

2012. The intent and meaning of the terms used in these standards are, unless otherwise defined herein, the same as those of the National Electrical Code.

2013. These protective signaling systems consist of electrical circuits and associated instruments and devices having their operation under the control or domination of the owner or others interested in the property to be protected; they shall include owned, leased or rented systems.

2030. Approval.

2031. Information. At the request of the authority having jurisdiction, complete information regarding the system including specifications, wiring diagrams, and floor plans shall be submitted for approval prior to installation of equipment or wiring.

2032. Equipment. All devices, combinations of devices, and equipment constructed and installed in conformity with these standards shall be approved for the purposes for which they are intended.

2033. Acceptance Tests. Upon completion of a system, a satisfactory test of the entire installation shall be made in the presence of a representative of the authority having jurisdiction.

2034. Maintenance Agreement. Where required by the authority having jurisdiction, a satisfactory agreement on the maintenance, operation, and efficiency of the system shall be provided. All systems shall be under the supervision of qualified persons satisfactory to the authority having jurisdiction. These persons shall cause proper tests and inspections to be made at prescribed intervals and shall have general charge of all alterations and additions to the systems under their supervision.

2040. Installation and Design.

2041. Systems. All systems shall be installed in a workmanlike manner and in accordance with the specifications and standards approved by the authority having jurisdiction.

2042. Jarring. Devices shall be so located and mounted that accidental operation will not be caused by vibration or jarring.

2043. Grounding. All systems shall test free of grounds except parts of circuits or equipment which are intentionally and permanently grounded to provide ground fault detection, emergency ground signaling, or circuit protective grounding. All systems shall be so designed that they do not depend upon the effectiveness of any ground connection for normal operation.

2044. Pre-Signal Feature. It is recommended that systems in hotels, department stores, hospitals, and similar institutions having sounding devices within the protected premises, be so designed that initial fire signals will sound only in department offices, engine rooms, fire brigade stations and other central locations, with provisions whereby authorized persons may subsequently sound a general alarm.

2045. Use Restriction. Fire alarm systems shall be used for no other than fire-protective signaling purposes, except that local control functions, necessary to make the premises safer in the event of fire, or to make it possible to hear fire alarm signals, may be automatically performed. In no case shall such circuit breakers or engine stops be installed in such a manner as to cut off the power for lighting or for operating elevators.

2046. Voltage Variation. A system shall be so designed and installed that it shall be capable of performing its intended function at 80 per cent and at 110 per cent of the rated voltage.

2047. Rewinding or Resetting. All apparatus requiring rewinding or resetting to maintain normal operation shall be restored to normal as promptly as possible after each test or alarm, and kept in normal condition for operation.

2048. Coded Alarm Signal. A coded alarm signal shall consist of not less than three complete rounds of the number transmitted.

ARTICLE 210. WIRING.

2110. General.

2111. The provisions of this Article apply to installation wiring for interconnecting system components.

2112. Fire-protective signaling circuits, at multiple circuit terminal and junction locations where circuits for other purposes are present, shall be marked for identification or so protected as to avoid interruption of service due to short-circuiting or other conditions of testing and servicing which might affect adversely the connected fire-protective signaling equipment.

2120. Exposure.

2121. Insulation. The insulation materials of conductors and cables shall be suitable for the normal conditions to which they are exposed in service.

2122. Wiring, cables, and terminal and junction facilities, unless adequately protected, shall be located where they are not exposed to hazardous or corrosive atmospheres, stored combustible materials, or to other potential hazards which might cause disruption of service.

Outside Wiring.

2130. Circuits.

2131. Wiring circuits reserved solely for fire-protective signaling services and complying with the requirements of the National Electrical Code for communication circuits are acceptable for outside wiring.

2132. To secure the greatest measure of protection and dependability in the operation of protective signaling systems it is recommended that all wires outside buildings be placed underground.

Inside Wiring.

2140. General.

2141. All inside wiring shall be in conformity with the requirements of the National Electrical Code for Class 1 signal systems except as otherwise indicated in this Article, or other Articles, of this Standard.

2150. General Circuit Cables.

2151. Cable approved for the purpose may be used as a method of wiring for general circuits operating at 150 volts or less.

2152. Cable for use for general circuits operating at 150 volts or less shall be constructed as follows:

a. Conductors shall be of solid copper, not less than No. 14 AWG for single- and two-conductor cables, not less than No. 18 AWG for three- and four-conductor cables, and not less than No. 22 AWG for cables having more than four conductors.

b. The individual conductors shall have rubber or thermoplastic insulation having a nominal thickness of not less than 1/32 inch.

c. The cable conductors shall have a lead sheath or a moisture-resistant and flame-retardant jacket providing equivalent protection against mechanical injury to that obtained with non-metallic sheathed cable described in the National Electrical Code.

2160. Limited Energy Fire Detector Circuit Cables.

2161. Special cable may be used for limited-energy fire detector circuits where the following conditions exist:

a. The open circuit voltage does not exceed 50 volts.

b. Overcurrent protection of not more than 2-amperes rating is provided. A fuse used for this purpose shall be of non-interchangeable type. If the current is taken from a transforming device having energy-limiting characteristics, the fuse may be omitted.

c. The capacity of the supply circuit is limited in its maximum rated output to 100 volt-amperes.

2162. Conductors of a cable for use with limited-energy circuits shall be of solid copper not smaller than No. 22 AWG and shall have thermoplastic insulation of not less than 0.012 inch nominal (0.010 inch minimum) thickness. The cabled conductors shall have a thermoplastic jacket over-all having a nominal thickness of not less than 0.035 inch (0.030 inch minimum). Two-conductor assemblies may be in flat parallel construction with 1/32 inch nominal integral-insulation jacket and an 0.047 inch minimum web. Approved low-energy circuit cable may be used. Other insulation having equivalent performance characteristics may be acceptable.

2170. Cable Installation.

2171. The cables described in Sections 2150 and 2160 may be

installed exposed on ceilings, and on side walls if not less than 7 feet from the floor, if adequately protected against injury. Concealed cable and cable passed through floors or located on side walls within 7 feet of the floor shall be installed in conduit or other approved raceway. Cable shall be supported and terminated in approved fittings.

2180. Line Thermostats.

2181. Line type thermostats, including insulated copper tubing of pneumatically-operated detectors employed for both detection and current-carrying purposes, shall be installed in conformity with paragraph 2171 and shall provide adequate insulation for the voltage applied to the thermostat.

ARTICLE 220. POWER SUPPLY SOURCES.

2210. General.

2211. The provisions of this Article apply to sources of power supply which shall be used, for the type of system involved, subject to acceptance by the authority having jurisdiction.

2212. Equipment. The equipment shall be approved for the particular application.

2213. Installation. All power supply equipment (batteries, battery chargers, rectifiers, switching facilities, transformers, etc.) and wiring shall be installed in conformity with the requirements of the National Electrical Code for such equipment except as otherwise indicated in this Article.

2220. Light and Power Services.

2221. General. A reliable electric light or power service may be used as a source of supply for fire-protective signaling systems under the following conditions:

a. Two-Wire Supplies. A two-wire supply circuit may be used for either the main operating power supply or the trouble signal power supply of the signaling system.

b. Three-Wire Supplies. A three-wire a-c or d-c supply circuit having a continuous unfused neutral conductor, or a polyphase a-c supply circuit having a continuous unfused neutral conductor where interruption of one phase does not prevent operation by the other phase, may be used with one side or phase for the main operating power supply and the other side or phase for the trouble signal power supply of the signaling system.

2222. Point of Connection. The conductors of the signaling system power supply circuit shall be connected on the line side of the main service of a commercial light or power supply circuit or to the main bus bars of an isolated power plant located on the premises. A circuit disconnecting means shall be so installed that it will be accessible only by authorized personnel.

[fol. 1384]

2223. Fuse. A fuse enclosed in a locked or sealed cabinet located immediately adjacent to the point of connection to the light and power conductors shall be provided in series with each ungrounded conductor. A suitable resistor connected between the supply source and the fuse shall be provided, where necessary, to limit the short-circuit current at the fuse to not more than 10,000 amperes.

2230. Motor-Generators.

2231. General. A motor-generator set shall be used only where an operator is on duty at all times. Power for operating the motor-generator shall be available from not less than two independent sources of energy. One source may be a special generator plant driven from some form of prime mover continuously available.

2240. Storage Batteries.

2241. Location. Storage batteries shall be so located or enclosed that the equipment of the signaling system including over-current protective devices will not be affected adversely by battery gases.

2242. Charging Source. A reliable source of power supply of not more than 250 volts shall be provided for charging the batteries. Where the record of continuity of the supply source makes it desirable, two separate, independent sources of supply shall be provided.

2243. Over-Current Protection. The battery shall be protected by over-current devices having a rating of not less than 150 per cent and not more than 200 per cent of the maximum operating load applied to the battery.

2244. Charging Method. The method of charging a battery shall provide either integral meters or readily accessible terminal facilities for the connection of portable meters by which the battery voltage and charging current can be determined.

2245. Cycle-Charged Batteries.

a. Duplicate Sets. Duplicate sets of batteries shall be employed for cycle-charging.

b. Capacity. Each set of storage batteries shall be capable of operating the system under the maximum normal load condition without recharging for not less than sixty consecutive hours when employed for a local or auxiliary system and for not less than twenty-four hours when employed for a proprietary system.

c. Charging. Provision shall be made for transferring each set of batteries to either load or charging circuits in a practical manner without affecting the system performance adversely.

2246. Trickle-Charged Batteries.

a. Venting. Provision shall be made to prevent spraying of the electrolyte of the battery while the battery is being charged at the maximum rate permitted by its charging means.

[fol. 1385]

b. Capacity. The battery shall be capable of operating the system for not less than 24 hours with the maximum normal load and with the power supply to the charger disconnected.

c. Charging. Adequate facilities shall be provided to maintain the battery fully charged under all conditions of normal operation.

d. Rectifiers. A rectifier shall be energized by an insulating transformer having a supply circuit of not more than 250 volts.

2250. Rectifiers, Direct-Connected.

2251. General. A rectifier employed as a direct source of supply for a signaling system shall be approved for the purpose and of adequate capacity to maintain voltage regulation between 130 per cent of rated voltage at no load and 100 per cent of rated voltage at maximum rated load.

2260. Primary Batteries.

2261. Use. A primary battery (including dry cells) shall not be used as the main operating supply of a signaling system. It may be used:

a. As a source of supply for operating trouble signal devices.

b. As an emergency auxiliary source of supply for operating a signaling system temporarily in the event of interruption of the main operating supply.

NOTE: The use of a common battery for both conditions (a) and (b) above is acceptable.

c. As a source of bias potential where depreciation of the battery results in a trouble signal when the circuit becomes inoperative.

2262. Location. Primary batteries shall be located not less than 6 inches nor more than 6 feet above the floor in a clean dry place where the ambient air temperature will not be less than 40° F. and not more than 100° F.

2263. Enclosure. A primary battery shall be housed in a locked substantial enclosure or otherwise suitably protected against movement, injury, and moisture. A reliable separation between cells shall be provided to prevent contact between terminals of adjacent batteries and between battery terminals and other metal parts which may result in depletion of the battery or other deterioration.

2264. Insulating Containers. Battery cells having containers constructed of other than suitable electrical insulating material shall be located on insulating supports.

2265. Connectors. Primary batteries shall be interconnected by suitable connectors.

2266. Inspection and Test. Each primary battery shall be inspected and tested to determine its terminal voltage while supplying the maximum load permitted by its application at least once each month. The battery shall be replaced when this voltage indicates its minimum rated discharge voltage.

[fol. 1386]

2267. Maximum Load. The maximum normal load of a primary battery shall not be more than 2 amperes per cell.

2268. Capacity. A primary battery shall have sufficient capacity to supply 125 per cent of the maximum normal load of the system for not less than one year.

2269. Replacement of No. 6 Dry Batteries. No. 6 batteries shall be replaced under the following conditions:

a. An individual dry battery cell rated 1½ volts shall be replaced when its short-circuit current is less than ten amperes or when a load of one ohm reduces the potential below one volt.

b. A unit assembly of dry battery cells rated 6 volts shall be replaced when a load of four ohms reduces the potential of the unit below four volts.

ARTICLE 230. OVERCURRENT PROTECTION.

2310. General—Batteries.

2311. See Paragraphs 2223 and 2243.

2320. Conductors.

2321. Conductors shall be protected in accordance with their rated current-carrying capacities as given in the National Electrical Code.

2330. System Control Units.

2331. A system control unit shall be protected on the supply side by over-current devices having a rating not greater than 150 per cent of the rating of the control unit.

2340. Transformers.

2341. A transformer shall be protected on either the primary or secondary side by overcurrent devices having a rating not greater than the continuous duty rating of the transformer unless the current is limited to the same value by other approved means.

ARTICLE 240. ELECTRICAL SUPERVISION.

2410. General.

2411. Except as otherwise indicated in this Standard, a system shall be electrically supervised so that the occurrence of a break or a ground fault condition of its installation-wiring circuits which prevents the required operation of the system, or failure of its main power supply source, will be indicated by a distinctive trouble signal.

NOTE: (a) The provision of a double loop or other multiple-path conductor circuit to avoid electrical supervision is not acceptable except as indicated in Paragraph 2424a.

(b) Electrical supervision of conductors for a short circuit fault is not contemplated by this requirement.

[fol. 1387]

2420. Electrical Supervision. The electrical supervision shall include:

2421. Power Supply Circuit Supervision. All sources of energy except the following secondary sources:

a. One employed for the operation of trouble signal circuits and appliances.

b. One employed as an auxiliary means for maintaining the normal operation of the system following trouble signal indication when the main supply source is interrupted.

c. One employed as a means for operating a supplementary circuit for alarm bells, annunciators, time stamps and similar circuits, the failure of which will not prevent the operation of the system for the required signals.

d. The battery leads of a trickle-charged battery.

e. The neutral of a three, four or five wire a-c or d-c supply source.

2422. Signal Initiating Circuits. All circuits for signals initiated by the operation of fire alarm boxes, fire detectors, automatically operated transmitters, or other appliances or devices which initiate or transmit signals either manually or automatically, except:

a. A non-interfering shunt circuit, provided that a fault condition of the shunt circuit wiring results only in the loss of the non-interfering feature of operation.

b. The circuits of a supplementary signal annunciator, provided that the fault condition of this circuit wiring results only in the loss of annunciation.

c. The circuits of thermostats or detectors of a metallic tubing automatic fire alarm system where the wiring terminals of such devices are connected in multiple across electrically supervised circuits.

2423. Supplementary Control Circuit. A supplementary circuit for operating fan motor stops or similar industrial control equipment intended to be actuated at the time of an alarm signal, need not be electrically supervised, provided a fault condition of the circuit in no way affects the normal operation of the signaling system.

2424. Alarm Signal Sounding Circuits. All circuits for operating alarm sounding devices and appliances except:

a. Alarm signal sounding appliances when (1) alternately connected to two or more circuits and approximately equally distributed throughout the building, or (2) connected to a return loop circuit so that a break or ground fault does not prevent the operation of any sounding appliance and with means provided for testing the continuity of the circuit.

b. A circuit employed to produce a supplementary local alarm signal to indicate the operation of an automatically operated alarm transmitter or a manual fire alarm box provided that an open or ground fault of the signal circuit conductor results only in the loss of the supplementary signal.

826

[fol. 1388]

c. The circuit of an alarm bell installed in the same room with a system control unit, provided the bell circuit conductors are installed in conduit or equivalently protected against mechanical injury and tampering.

d. A trouble signal circuit.

2425. **In a Supervising Station.** Where personnel responsible for the supervision and operation of the system are on duty continuously, the following features or facilities located in the supervising station need not be electrically supervised.

a. The station circuits for alarm bells and registers which are controlled by devices which have their operating circuits electrically supervised.

b. Main power supply failure if the condition is otherwise indicated so as to be obvious to the operator on duty.

2430. **Trouble Signals.**

2431. **Distinctive Trouble Signals.** Trouble signals shall be distinctive from alarm signals and shall be indicated by the continuous operation of a sounding appliance or, where there is supervisory attendance at all times, by a suitable coded signal. An audible trouble signal may be common to several supervised circuits.

2432. **Silencing Switch.** A switch for silencing the trouble signal sounding appliance may be provided only if it transfers the trouble indication to a lamp or other acceptable visible indicator adjacent to the switch. The visible indicator shall remain operated until the silencing switch is restored to its normal position unless the audible trouble signal will be obtained when a fault occurs without restoring the switch to normal.

2433. **Location of Trouble Signal.** Trouble sounding appliances shall be located as required by the authority having jurisdiction.

ARTICLE 250. AUDIBLE SIGNALING APPLIANCES.

2510. **Evacuation Systems.**

2511. Fire alarm systems provided for evacuation of occupants of factories, workshops, institutions and similar premises shall have one or more audible signaling appliances approved for the purpose on each floor of the building, so located that their operation will be heard clearly regardless of the maximum noise level obtained from machinery or other equipment under normal conditions of occupancy. Each section of a floor divided by a fire wall may be considered as a separate floor for the purpose of this protection.

2520. **Distinctive Signals.**

2521. Audible signal appliances of a fire alarm system shall produce signals which are distinctive from other similar appliances used for other purposes in the same area. Different types of fire-protective audible signaling appliances in the same area are not recommended.

[fol. 1389]

ARTICLE 260. SIGNAL CAPACITY OF CIRCUITS.

2610. General.

2611. The number of signal transmitting devices connected to any signaling circuit shall be limited to avoid interference. The total number of code wheels connected to a single circuit shall not exceed two hundred fifty.

2620. Separate Alarm Signal Circuits.

2621. It is recommended that alarm signal transmitting devices be connected to signaling circuits reserved solely for alarm signals.

2630. Combined Alarm and Supervisory Signal Circuits.

2631. When both sprinkler supervisory signals and fire or waterflow alarm signals are transmitted over the same signaling circuit, provision shall be made to either obtain alarm signal precedence or sufficient repetition of the alarm signal to prevent the loss of any alarm signal transmitting devices. The trouble signal of a combined alarm and supervisory signal circuit shall not be used for the supervisory signal feature except as indicated in Paragraph 3422.

2640. Loading Capacity of Alarm Circuits.

2641. One signaling circuit shall serve not more than twenty-five plants.

NOTE: A plant may consist of one or more buildings under the same ownership and the circuit arrangement shall be such that an alarm signal will not be received from more than one transmitting device within a plant at a time.

2650. Loading Capacity of Sprinkler Supervisory Signal Circuits.

2651. One signaling circuit may serve not more than twenty-five plants.

NOTE: A plant may consist of one or more buildings under the same ownership.

2660. Loading Capacity of Watch Supervisory Signal Circuits.

2661. Connections to a watch supervisory signal circuit, or to a combination manual fire alarm and watch signal circuit, shall be so limited that not more than sixty scheduled watch report signals will be transmitted in any one-hour period. Patrol scheduling shall be such as to avoid interference between watch report signals.

[fol. 1390]

CHAPTER 3. TYPES OF SIGNALING SERVICES.

ARTICLE 300. SCOPE.

3010. The provisions of this Chapter apply to signaling services which may be provided individually or in combination by different types of systems except as otherwise indicated for each type of system.

ARTICLE 310. MANUAL FIRE ALARM SERVICE.

3110. Fire Alarm Boxes.

3111. General. Manual fire alarm boxes shall be approved for the particular application and shall be used only for fire protective signaling purposes. Combined fire alarm and watchman's signaling boxes are acceptable.

3112. Mounting. Each box shall be securely mounted. It is recommended that the bottom of the box be not less than 4½ feet and not more than 6 feet above the floor level.

3113. Distribution. Manual fire alarm boxes shall be distributed throughout the protected area so that they are unobstructed, readily accessible, and located in the normal path of exit from the area, and as follows:

a. One box shall be provided on the first floor and on each succeeding alternate floor except that one box shall be provided for each floor where the maximum fire area is 10,000 square feet or more.

b. Additional boxes shall be provided on each floor to obtain a maximum horizonal travel distance of 200 feet to the nearest box.

3114. Coded Signal Designations. A coded fire alarm box shall produce not less than three signal impulses for each revolution of the coded signal wheel.

NOTE: The following suggested coded signal assignment for a building having four floors and basements is provided as a guide:

Location	*Coded Signal*
4th floor	2–4
3rd "	2–3
2nd "	2–2
1st "	2–1
Basement	3–1
Sub-basement	3–2

ARTICLE 320. WATCHMAN'S TOUR SUPERVISORY SERVICE.

3210. General.

3211. The number of watchman's reporting stations, their locations, and the route to be followed by the watchman for operating the station shall be approved for the particular installation.

[fol. 1391]

3220. Signal Recording.

3221. A permanent record indicating each time each signal transmitting station is operated shall be made at a supervising location.

3230. Suppressed Signal Type.

3231. When intermediate stations which do not transmit a signal are employed in conjunction with signal transmitting stations, distinctive signals shall be transmitted at the beginning and end of each tour of a watchman and a signal transmitting station shall be provided at intervals not exceeding ten stations.

3232. Intermediate stations which do not transmit a signal shall be capable of operation only in a fixed order of succession.

3233. Stations which transmit a signal only when not operated within a prescribed time interval may be used as intermediate stations where a fixed route is not considered necessary to assure complete watch service.

ARTICLE 330. AUTOMATIC FIRE DETECTION AND ALARM SERVICE.

3310. General.

3311. The provisions of this Section apply to systems employed for automatic fire alarm signals.

3320. Supplementary Manual Alarm Signal Operation.

3321. Supplementary means for manually operating an automatic fire alarm system for an alarm signal should be located where designated by the authority having jurisdiction. (See Paragraph 3421.)

3330. Detecting Equipment.

3331. Location. Fire detecting equipment shall be located upon the ceiling or on the side walls not more than 20 inches below the ceiling. It shall be installed throughout all parts of the protected premises including all rooms, halls, storage areas, basements, attics, lofts and other subdivisions and accessible spaces; and inside all closets, elevator shafts, enclosed stairways, dumb waiter shafts, chutes, and other minor subdivisions and enclosures.

a. Where codes, standards, laws or authorities having jurisdiction require the protection of selected areas only, the specified areas shall be protected in accordance with this Standard.

b. For the purposes of this Article the area underneath a deck, mezzanine, or floor landings of stairways having a minor dimension of four (4) feet or more shall be considered a separate subdivision and shall be protected accordingly.

c. Protection may be required under large benches, shelves, or tables and inside cupboards or other enclosures not extending to the ceiling.

d. Protection may also be required underneath open loading docks or platforms and their covers, and for accessible underfloor spaces of buildings without basements.

[fol. 1392]

3332. High Temperature Areas. Special instructions shall be obtained from the authority having jurisdiction regarding the use of high temperature degree thermostats in boiler rooms, heating boxes, skylights, etc.

3333. Spacing. Detector spacings shall not exceed the linear maximums indicated in Underwriters' Laboratories, Inc. Fire Protection Equipment List for the particular device used. Closer spacing may be required due to structural characteristics of the protected area, possible drafts, or other conditions affecting detector operation. Spacing of thermostats at right angles to solid joists should be reduced 50 per cent.

3334. Support. Thermostats shall be supported in all cases independently of their attachment to the wires.

3335. Tests. Fire detectors shall be tested periodically as specified by the authority having jurisdiction.

ARTICLE 340. SPRINKLER SYSTEM WATERFLOW ALARM AND SUPERVISORY SIGNAL SERVICE.

3410. Scope.

3411. The provisions of this Article apply to sprinkler system signaling attachments for indicating the flow of water in the system and for indicating the off-normal condition of sprinkler system components which may affect the performance of the system adversely.

3420. General.

3421. Supplementary Manual Alarm Signal. It is recommended that premises having a sprinkler system equipped to provide a waterflow alarm signal having supplementary means for manually transmitting an alarm signal located in the normal path of exit from the area.

NOTE: For combined alarm signal circuits, see Section 2640.

3422. Supplementary Pressure Supervisory Signal. A dry pipe sprinkler system equipped for waterflow alarm signals only should provide supplementary supervision of the system air pressure to avoid false alarm signals due to neglect in maintaining air pressure. Connection of the pressure supervisory signal attachment contacts to obtain trouble signal operation of the transmitter used for waterflow alarm signals is acceptable for this purpose.

3423. Signal Identification. The signal received shall indicate the particular feature of the sprinklered property which is abnormal (off-normal) and when it has been restored to normal.

3424. Tampering. A signal attachment and its circuits shall be so designed and installed that they cannot be readily tampered with or removed without causing a signal to be produced.

3430. Waterflow Alarm Service.

3431. General. Provision shall be made to indicate the flow of water in a sprinkler system, except movement of water due to waste,

surges, or variable pressure, by an alarm signal. The waterflow signaling attachment shall operate to indicate any leak or flow of water occurring at a rate of ten or more gallons per minute.

3440. Supervisory Signal Services.

3441. General. Provision shall be made for supervising the required conditions, which are essential for the proper operation of sprinkler systems except those related to water mains, tanks, cisterns, reservoirs, and other containers of water controlled by a municipality or a public utility.

3442. Gate Valve Position Supervision. A gate valve shall be supervised to obtain two separate and distinctive signals, one indicating movement of the valve from its normal position and the other indicating restoration of the valve to its normal position. The off-normal signal shall be obtained either during the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.

a. Where the signaling attachments of two or more valves utilize a common circuit a restoration signal shall be obtained only when all of the valves of the group are in their normal positions.

b. An attachment for supervising the position of a gate valve shall not interfere with the operation of the valve nor obstruct the view of its indicator nor prevent access to its stuffing box.

3443. Pressure Supervision. Pressure sources shall be supervised to obtain two separate and distinctive signals, one indicating that the required pressure has been decreased or increased and the other indicating restoration of the pressure to its normal value.

a. A pressure supervisory signal attachment for a pressure tank shall indicate both high and low pressure conditions. A signal shall be obtained when the required pressure is increased or decreased ten pounds from the required pressure value.

b. A pressure supervisory signal attachment for a dry pipe sprinkler system shall indicate both high and low pressure conditions. A signal shall be obtained when the required pressure is increased or decreased in accordance with requirements of the authority having jurisdiction.

c. A steam pressure supervisory attachment shall indicate a low-pressure condition. A signal shall be obtained when the normal pressure is reduced to a value which is not less than 110 per cent of the minimum operating pressure of the steam-operated equipment supplied.

d. An attachment for supervising the pressure of other sources than those specified above shall be capable of being applied and operated as required by the authority having jurisdiction.

3444. Water Level Supervision. Water storage containers shall be supervised to obtain two separate and distinctive signals, one indicating that the required water level has been lowered or increased and the other indicating restoration to the normal level.

a. A pressure tank supervisory attachment shall indicate both high and low level conditions. A signal shall be obtained when the water level is lowered or raised three inches from the required level.

b. A supervisory attachment for other than pressure tanks shall indicate a low level condition. A signal shall be obtained when the water level is lowered 12 inches from the required level.

3445. Temperature Supervision. Water storage containers shall be supervised to obtain two separate and distinctive signals, one indicating that the temperature of the water has been lowered to 40° F., and the other indicating restoration to the proper temperature.

3446. Pump Supervision. Automatic fire pumps, auxiliary booster and special service pumps shall be supervised as prescribed by the authority having jurisdiction.

ARTICLE 350. AUTOMATIC SMOKE ALARM SERVICE

3510. General.

3511. The authority having jurisdiction shall be consulted in all cases before installation of equipment.

3520. Signal Indication.

3521. Abnormal smoke density shall result in transmission of a distinctive smoke alarm signal to the central supervising station. The signal transmitted shall designate the building protected. The floor, section or subdivision of the building at which the signal originated shall be indicated also, either by the signal to the central supervising station or by approved visual means in or at building when the condition of occupancy and application of smoke detection are such that this feature is essential for adequate protection. Local systems shall sound an audible alarm and preferably indicate the building and floor from which the signal is transmitted.

3522. Smoke alarm service may include provision for connection of a supplementary circuit for actuation of equipment controlling blowers, fans, shutters, etc., at the time of a smoke alarm signal.

3530. Location of Detectors.

3531. Smoke detectors shall be so located and adjusted to operate reliably in case of smoke at any part of the area protected. The location of detectors should be based upon an engineering survey of the application of this form of protection to the area under consideration. These features include air velocity, number of detectors to provide adequate coverage of cross-sectional areas of the space with respect to travel, diffusion or stratification of smoke; location of detectors with respect to exhaust, intake or circulating blowers; air conditioning facilities, temperature variations, and the like. Such conditions vary with different installations and should be dealt with on the basis of experience in the service.

3532. Special consideration shall be given to the storage of contents of a protected space to provide unobstructed openings for the travel of smoke to the smoke detector.

3533. Where air conditioning or ventilating equipment serves the space to be protected by a smoke detector, particular attention shall be given to the intake, exhaust and circulation of smoke under any condition of operation of the equipment to insure prompt detection.

3534. Photo-electric light beams shall be so located or enclosed or otherwise arranged that movement of objects within the space protected will cause no signal.

3535. Light sensitive equipment shall be so located or shielded that light from any source other than that intended to be applied to the equipment will have no effect upon the detector. The opening of any enclosure during normal servicing shall cause no smoke alarm signal. A smoke detector shall be so installed as to minimize the possibility of operation due to accumulation of dust, moisture, deterioration of equipment, or any other condition of system operation not associated with fire or smoke.

3536. The conditions of occupancy of each space protected by a smoke detector shall be arranged to avoid operation of the detector due to the use of fumigants, or any other type of fog or mist producing materials, sweeping and cleaning resulting in dust circulation, and the like.

3537. The smoke detection combination shall be able to withstand 110 per cent of the rated voltage continuously without injury during the normal supervisory condition and shall operate successfully during the normal signaling condition at the increased voltage and also at 80 per cent of normal voltage.

3538. All smoke detecting equipment shall be secured reliably in place. The security of separate photo-electric light source and receiver units shall insure against the change of adjustment due to vibration, change in alignment of supporting surfaces, or the like.

3539. Provision shall be made to afford adequate protection of the smoke detection equipment from mechanical injury.

3540. **Maintenance Servicing.**

3541. All equipment requiring servicing shall be readily accessible and shall provide practical means for cleaning parts which accumulate dust, replacement of illuminating lamps, etc.

3542. Suitable and practical facilities shall be provided to permit periodic testing for sensitivity.

3543. The equipment shall be inspected monthly and maintained in proper operating condition.

3550. **Circuit Arrangement.**

3551. A smoke detecting combination of a Class A Proprietary System shall be capable of operating for a smoke alarm signal during a single break or a single ground fault condition of the circuit wiring conductors (a) between the central supervising station and the smoke alarm signal transmitter and (b) between the smoke alarm signal transmitter and the smoke detector control unit, except as indicated in Paragraph 3552.

3552. The requirement of Paragraph 3551 does not apply to the circuits between the smoke alarm signal transmitter and the smoke detector control unit if both of these units are located in a common enclosure, or in adjacent enclosures not more than three feet apart and having the circuits between the enclosures run in conduit.

3553. The motor of a blower provided as a part of a smoke detector shall be electrically supervised to indicate stalling or burnout.

3554. The requirements of Article 240 for electrical supervision of circuits applies to all wiring employed to interconnect separate units of a smoke detecting system and its power supply circuit wiring at the installation. In addition, the smoke detecting system shall provide electrical supervision of all filaments of photo-electric cell illuminating lamps and the filaments and heaters of all electronic tubes, if their failure prevents normal operation for a smoke alarm signal.

3555. The failure of electrically-supervised circuits and parts shall be indicated by a trouble signal which is distinctive from a smoke alarm signal.

CHAPTER 4. TYPES OF SYSTEMS.

ARTICLE 400. PROPRIETARY SYSTEMS.

(See Chapters 2 and 3 which also apply.)

4010. Scope.

4011. The provisions of this Article shall apply to a system supervised by competent and experienced personnel in a central supervising station at the property protected. The system is to include equipment and other facilities required to permit the operators to maintain, test and operate the system and upon receipt of a signal, take such action as shall be required under the rules established for their guidance by the authority having jurisdiction. These systems are designated "Class A" and "Class B". A Class A system provides emergency operation for fire alarm, waterflow alarm and watchman's supervisory signals during a single break or a single ground fault of the signaling line circuit. A Class B system does not include this emergency operating feature.

4020. Supervisory Station Structure.

4021. It is recommended that the supervisory station be located in a fire resistive, detached building or suitably cut-off room, and, in any event, shall not be near or exposed to the hazardous parts of the premises protected.

4030. Fire Department Signals.

4031. General. The central supervisory station shall have reliable means for transmitting fire alarms to the fire department over wires electrically supervised and under the control of the plant owner or occupant.

a. Where permissible and deemed necessary the means shall consist of a direct electrically-supervised line to the fire department, with suitable code-sending device and register, or a municipal fire alarm box, either of ordinary or auxiliary type, within fifty feet of the central supervising station.

b. It is recommended that there be a telephone line from the central supervising station to the fire department, such line to be available at all times and independent of the plant telephone switchboard.

4040. Signal Recording.

4041. The proprietary system shall be arranged to receive and record all signals received at its central supervisory station and to transmit to the fire department, indication of the building or group of buildings from which an alarm has been received.

4042. Recording Devices. Recording devices shall be so designed and arranged as to provide a permanent record. The time of receipt of all recorded signals shall be marked adjacent to the signal preferably by automatic means.

4050. Tests.

4051. Circuits. Facilities shall be provided at the central supervisory station on all circuits extending from the central supervisory station and on all local current sources at the central supervisory station for making the following daily tests:

a. Current strength on each circuit.

b. Voltage across terminals of each circuit at the inside terminals of protective devices.

c. Voltage between ground and each side of each circuit.

4052. Devices. Except as otherwise permitted by the authority having jurisdiction and as otherwise indicated in Paragraph 3335 complete and satisfactory tests of all coded and non-coded signaling devices shall be made quarterly.

4053. Records. A complete record shall be kept of the tests and operations of each system. The record shall be available for examination and where required, reported to the authority having jurisdiction.

4060. Durability.

4061. General. The devices and circuits shall be designed and installed so as to meet successfully the most severe conditions liable to be met in practice. No change or alteration shall be made without approval by the authority having jurisdiction.

4070. Operating Personnel.

4071. General. Watchmen and other employees not required to operate the system shall not be admitted to the central supervising station where signals are recorded.

[fol. 1398]

4072. Number of Operators. A sufficient number of reserve operators shall be kept in training so that at least two competent operators are on duty constantly, and, in addition, maintain a service so arranged that any building protected can be reached by a runner within 15 minutes. Runner service shall be so maintained that two operators will always be in attendance except, in an extreme case, one operator may be used as a runner. All runners shall be of a mature age.

4073. Modification. The authority having jurisdiction may modify or reduce the number of operators where alarms are automatically transmitted to the fire department and the number and kind of installations indicates satisfactory supervision can be maintained over the system. Operation and supervision shall be the primary function of the operators and no other interest or activities shall take precedence over the protective service.

4080. Emergency Operation of Circuits—Class A System.

4081. Signaling Line Circuits. Each signaling line circuit and the devices connected to it shall be capable of operating for their intended signaling services during a single break or a single ground fault condition of any signaling circuit conductor.

NOTE: It is intended that this emergency signaling feature of operation will be obtained by either automatic or manual adjustments of the signaling circuit when the fault condition is indicated by a trouble signal.

4082. Transmitter Actuating Circuits. An automatic transmitter employed for waterflow alarm signals shall be capable of operating for an alarm signal during a single break or a single ground fault condition of any of its device circuit conductors except as indicated in Paragraph 4083.

NOTE: It is intended that this emergency signaling feature of operation will be obtained by automatic adjustment of the transmitter when the fault is indicated.

4083. Exceptions. The requirements of Paragraph 4082 may be waived by the authority having jurisdiction where a separate automatic transmitter is employed for each actuating device, if the conductors are installed in conduit, and the actuating device and automatic transmitter are adjacent to each other (within twenty feet).

4090. Circuits.

4091. General. Circuits shall be so arranged that a single break or a single ground shall not cause a false alarm signal. A break or a ground which prevents the normal functioning of any circuit shall be automatically indicated at the central supervisory station by a trouble signal which will compel the attention of attendants. The trouble signal shall be distinguishable from other signals, except where such other signals denote an abnormal condition of supervised parts of a fire-extinguishing system.

4100. Signals and Reports.

4101. General. Arrangements shall be made to furnish such reports of signals that may be received and in such form as may be required by the authority having jurisdiction. Daily reports may be required.

4102. Automatic Fire Detection Signals. Provision shall be made to designate by the signal transmitted, the building in which a signal originates. The floor, section, or other subdivision of the building shall be indicated by either the signal transmitted to the supervising station or by approved visual means in or at the building protected, except that the authority having jurisdiction may waive this detailed indication where the area, height, or special conditions of occupancy make it unessential.

4103. Sprinkler System Supervisory Signals. See Paragraph 3423.

4104. Combined Waterflow Alarm and Manual Fire Alarm Signals. When signals from manual fire alarm boxes and waterflow alarm signaling devices within a building are transmitted over the same signaling circuit, there shall be no interference with the fire box signals when both types of signaling devices are operated at the same time. Provision of the shunt non-interfering method of operation is acceptable for this performance.

4110. Disposition of Signals.

4111. Upon receipt of trouble signals or other signals referring to matters of purely equipment maintenance of the signaling system, the station operator shall immediately send a runner to investigate and, if possible, see that the trouble is remedied at once.

Written notice shall be given the authority having jurisdiction and the property owner in all cases where service of the signaling system is interrupted and is not immediately corrected.

4112. Upon receipt of signals showing flow of water in the system, the central supervisory station shall notify the fire department and such other parties as the authority having jurisdiction may require.

They shall also despatch a runner to the location indicated.

They shall also notify the property owner by telephone or by the quickest method available.

In addition to which written notice should be given to the property owner.

In all cases where notification is required to parties with whom private lines of communication have not been provided, the quickest available means of communication shall be used.

4113. If at any time a combination signal is received which from its nature is indicative of water flow on the premises equipped, such combination signal shall be treated by the central supervising station as a fire alarm, provided that the authority having jurisdiction may waive the notification of the fire department for sprinkler flow alarms during working hours unless accompanied by other signals

indicating a probable fire. Definite instruction as to the handling of alarms shall be posted for the guidance of operators.

4114. All alarms initiated by manual or automatic fire alarm devices are to be treated as fire alarms and be transmitted to the city fire alarm office and patrol, or such other place as required by the authority having jurisdiction.

4115. Upon failure of the watchman to transmit his regular signal within the period of grace provided, the operator shall despatch a runner and shall also endeavor to get in touch with the watchman or someone else by telephone or by calling back over the system circuit. A suitable record shall be made, and the owner shall be notified in writing. Failure of a watchman to follow a definite route when such is required shall be considered a delinquency which shall be reported in writing to the owner and to the authority having jurisdiction.

4116. Sprinkler system supervisory and other supervisory alarms shall be immediately communicated to a designated person at the plant protected, and shall be investigated by a runner unless supervised conditions are restored to normal. The authority having jurisdiction and the owner shall be notified of the signal and time of occurrence and restoration of service. Notice shall be given the fire department when sprinkler systems are wholly or partially out of service.

4117. A man shall be available within two-hour travel who is competent to inspect, maintain and repair the system.

ARTICLE 420. AUXILIARY FIRE ALARM SYSTEMS.

(See Chapters 2 and 3, which also apply.)

4210. General.

4211. Auxiliary systems shall be used only in connection with a municipal system which is suitable for the service and is well maintained, and when a permit for such connection has been given by the municipal authorities.

4212. Remote control and other devices and auxiliary attachments shall be approved for the purpose intended; auxiliary attachments shall also be approved for the particular type and design of box or transmitter to which they are to be applied.

4213. Equipment shall be under the supervision of a responsible and qualified person or organization satisfactory to the authority having jurisdiction and to the municipal authorities, and who shall be under contractual requirement to make all inspections and tests and to promptly make repairs, and who shall receive prompt notification of trouble.

4214. At intervals not exceeding thirty (30) days, there shall be a complete inspection and test of the system. Where possible to test remote control devices, one-sixth of such devices shall be tested on each inspection, and all devices, including the auxiliary attachment, shall be tested every six months. Results shall be reported to the authority having jurisdiction.

4215. The devices and circuits shall be so designed and installed as to meet successfully the most severe conditions liable to be met in

practice, and no change, alteration or addition shall be made without written approval of the authority having jurisdiction.

4216. A municipal street box shall not be used as a master box, and a special master box shall be installed for each building or, where permitted by the authority having jurisdiction, each group of small buildings of single ownership or occupancy.

4217. The system shall be so designed and arranged that trouble on the auxiliary system shall not jeopardize operation of the municipal system, and shall not, in case of trouble on either the auxiliary or the municipal system, transmit a false alarm of fire. This shall not prohibit the use of a local circuit, the opening of which will result in the transmission of a fire alarm, where such local circuit is in not more than 3 feet of rigid conduit between the master box or transmitter and a special controlling device on the same support as the box or transmitter and located where it will be accessible at all times to the official in charge of the municipal fire alarm system.

4218. Auxiliary circuits shall be so arranged that trouble on or the operation of any auxiliary device or circuit shall not render inoperable more than 50 manually operated remote control devices or water-flow devices, nor devices in more than one building or group of small buildings of single ownership or occupancy.

4219. Circuits shall comply with Article 240, and trouble condition on the circuits in the premises protected or, except as to the short local circuit permitted in Paragraph 4217 above, leading to the auxiliary attachment or to a special transmitter shall be indicated by a distinctive trouble signal in the quarters of some responsible official. (See Section 2430 and Paragraph 4213.)

4220. For systems having manual operation only, the trouble signal may be at the plant protected; for systems having automatic or manual and automatic operation, the trouble alarm shall be where there is someone on duty at all times with facilities for immediately notifying the repair man. (See Paragraph 4213.)

4221. Definite indication at or near the master auxiliarized box or transmitter shall be given to show from which building of a group of small buildings, of single ownership or occupancy, an alarm has been transmitted, or if the auxiliarized box was operated by manual pulling of the box itself. The provisions of this section may be waived, upon application, by the authority having jurisdiction where the size or other special conditions are such that these indications are not deemed essential.

4222. Remote control devices may be of manual or automatic type, as water-flow devices, thermostats, etc., but shall be of such design as to minimize false alarms, and shall be used only to initiate a fire signal, or a signal considered as a fire signal.

4223. Remote control stations of the manually operated type shall comply with Article 310.

4224. Automatic alarm systems and devices shall comply with Chapter 3 as to location and functions to be performed.

4225. The auxiliarized box or transmitter shall be of successful type, and acceptable to the official in charge of the municipal system.

NOTE: The requirements of the Standard for Municipal Fire Alarm Systems (NBFU No. 73) are also applicable.

4226. Master boxes shall have indication, visible from outside of the box, with an alarm bell for audible indication, to show whether the box has been reset, unless boxes are of the self-restoring type.

4227. The placing of a master box inside a building is not recommended. If located inside a building, master boxes shall be placed as near as practicable to the point of entrance of the circuit.

4228. Each automatically operated auxiliary circuit or system shall have at least one manual-pull station as an auxiliary means for actuating the system.

4229. Where used in connection with local alarm systems within the premises protected, the system shall be so arranged that operation of a remote-control station will always trip the master box or transmitter and also sound the local alarm. The requirements for the simultaneous operation of the master box and the local alarm may be waived by the authority having jurisdiction when special conditions or occupancies make the sounding of the local alarm undesirable.

4230. Fire alarm circuits shall be in rigid conduit or electrical metallic tubing, installed as for light and power wiring as provided in the National Electrical Code.

ARTICLE 430. REMOTE STATION FIRE ALARM SYSTEMS.

(See Chapters 2 and 3, which also apply.)

4310. General.

4311. This section applies to a system employing a direct circuit connection between alarm signal actuating devices in protected premises and signal-indicating equipment in a remote station, such as fire or police headquarters or other place acceptable to the authority having jurisdiction. (See Section 2030.)

4320. Remote Station Circuit.

4321. The circuit between the protected premises and the remote station shall be reserved solely for fire alarm signaling services.

4330. Electrical Supervision.

4331. Circuits within the protected premises and between the protected premises and the remote station shall be electrically supervised so that the occurrence of a single open fault or of a single ground fault or the loss of a source of energy, other than that excepted in paragraph 4332, which prevents normal signaling performance at the remote station, will be indicated by a distinctive trouble signal at the remote station or other place acceptable to the authority having jurisdiction. Facilities shall be provided for transferring the

trouble signal to a lamp or other acceptable annunciator when the audible trouble signal is silenced.

4332. The alarm indicating bell or register circuits and their source of energy within the remote station need not be electrically supervised.

4333. Loss of a source of energy or a single open or a single ground fault at any part of the complete system shall not result in a false alarm signal at the remote station.

4340. Alarm Signal Silencing.

4341. Provision may be made for silencing an audible signal used for alarm signals at a remote station. The silencing operation shall be indicated by transferring the signal to a lamp or other acceptable annunciator. When two or more alarm bell silencing switches are provided for two or more actuating-device circuits, the silencing position of any of these switches shall not prevent operation of the alarm bell by any other actuating device circuit having its switch in the normal position. Restoration of the circuit which has caused the alarm signal to the normal supervisory condition shall result in the operation of an audible trouble signal at the remote station until the alarm bell silencing switch is restored to its normal position, unless the alarm bell circuit is reconditioned automatically to operate for subsequent signals.

4350. Alarm Signal-Initiating Devices.

4351. The alarm signal-initiating devices (fire alarm or water-flow alarm) located in the protected property may be of either the coded or non-coded signal type. A distinctive alarm signal shall be provided at the remote station for each building, or where permitted by the authority having jurisdiction, for each group of buildings of single ownership or occupancy.

ARTICLE 440. LOCAL SYSTEMS.

(See Chapters 2 and 3, which also apply.)

4410. Scope.

4411. The provisions of this Article apply to electrically-operated systems designed primarily to notify occupants of the protected premises by producing signals at one or more places in the premises.

4420. General.

4421. The design of systems and the location of their alarm-initiating and alarm-producing components shall be as required by the authority having jurisdiction.

4430. Local Sprinkler Alarm Systems.

4431. Chapter 12 of the Standards for the Installation of Sprinkler Systems (NBFU No. 13) describes in detail the considerations affecting the installation of local sprinkler alarm systems.

4432. Electrical circuits of local waterflow alarm systems need not comply with Article 240.

4433. Bells shall be of the continuously-operating or vibrating type, not smaller than 6 inches in diameter.

4434. Operating features of the systems shall be tested at monthly intervals.

4435. No means shall be provided for silencing waterflow alarms except in such a manner that the act of silencing the normally active bell will positively transfer the waterflow alarm signal to another bell or audible alarm signal located in the quarters of a responsible person.

ARTICLE 450. MISCELLANEOUS SYSTEMS.

(See Chapters 2 and 3, which also apply.)

Watchmen's Time-Recording Apparatus.

4510. Local or Private Stationary Systems.

4511. A spring-motor driven clock shall run at least eight days without rewinding.

4512. The signal recording means shall be so enclosed that the recordings cannot be seen without opening the enclosure, except that the authority having jurisdiction may permit visible recordings where someone who can check the tours of the watchman is on duty.

4513. A distinctive recording shall be made to indicate the time of opening and closing of the enclosure.

4514. Systems involving sources of current supply other than magneto are deemed as falling within the requirements of Article 440 except as indicated in Paragraph 4515.

4515. When supplementary means are provided to insure that the watchman has visited his stations in a predetermined order, and when indication is automatically made of the number of stations visited:

a. Circuit wiring need not be electrically supervised.

b. Signal time-recording means may be operated by a self-starting electrical clock if a permanent record indicating stoppage of the clock is provided.

4520. Portable Watch Clocks.

4521. The clock used shall run for at least 48 hours without rewinding, shall be substantially mounted and strongly encased. It shall be made so that the watch recordings cannot be seen without opening the case and so that it cannot be opened without indicating, by a distinctive recording, the time of opening and closing.

4522. Records shall be legible and permanent.

4523. Stations shall be located as required by the authority having jurisdiction and fixed so that they cannot be removed without giving evidence of removal.

Keys shall be made so that they are difficult to duplicate, and shall be of a pattern susceptible of variations tending to reduce the probability that a set of keys fitted for one clock will operate other clocks.

GOVERNMENT EXHIBIT No. 3

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CENTRAL STATION BURGLAR ALARM SYSTEMS

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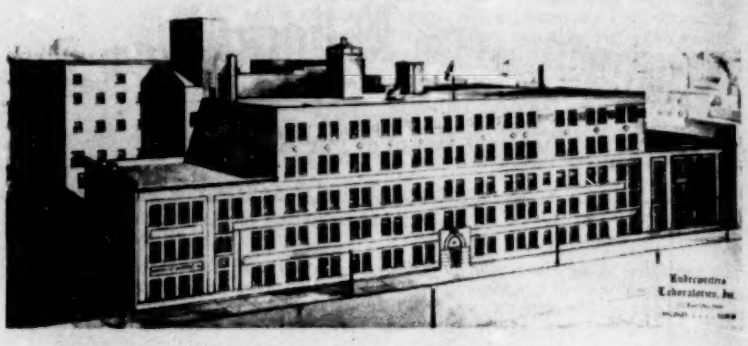

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Electrical Construction Materials
Electrical Appliance and Utilization Equipment
Hazardous Location Equipment
Fire Protection Equipment
Gas and Oil Equipment
Accident, Automotive, and Burglary Protection Equipment
Bi-Monthly Supplement to All Lists

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TABLE OF CONTENTS

Page

STANDARD FOR CENTRAL STATION BURGLAR ALARM SYSTEMS.. 5

REQUIREMENTS 6
Scope 6

GRADE B REQUIREMENTS 7

Physical Equipment 7
Central Station 7
Current Supply 8
Electrical Supervision 10
Switchboards, Relays, Signal Devices, Etc. 11
Outside Cable System 11
Subscriber's Equipment 12

Protection Service 12
General 12
Closed Period 13
Operating Force 13
Average Time to Answer Alarms 13
Guard Equipment 14
Regular Openings 14
Irregular and Special Openings 15
Closings and Closing Troubles 17
Alarms and Unauthorized Openings 17
Identification of Subscribers 18
Handling of Subscribers' Keys 18
Records 19
Maintenance 19

GRADE A REQUIREMENTS 20
Physical Equipment 20
Electrical Supervision 20
Subscriber's Equipment 20

Protection Service 20
Operating Force 20
Average Time to Answer Alarms 20
Number of Guards Dispatched 21
Irregular and Special Openings 21

GRADE AA REQUIREMENTS 2
Physical Equipment 2
General 2
Subscriber 2
Electrical Operation 3
Organization 3
Service Record 3
Protection Service 3
Operating Routine 3

TRANSMITTER SYSTEMS 5
General 5
Protection Service 5
Physical Equipment 5
Subscriber's Equipment 5
Central Station Circuit 5
Central Station Equipment 6

COMBINATION TRANSMITTER AND LOCAL SYSTEMS 7

CERTIFICATION OF INSTALLATIONS 8
Reexamination and Certificate Service 8
The Certificate 8
Field Inspections 8
Correction of Defects 8

NOTE

This Standard supersedes the edition of April, 1954.

In addition to editorial corrections, paragraphs 74 and 134 have been revised to eliminate the 20 percent limitation on outlying runs.

STANDARD FOR CENTRAL STATION BURGLAR ALARM SYSTEMS

1 This Standard represents the judgment of Underwriters' Laboratories, Inc. as to the basic requirements for the construction and performance of the products to be listed under this classification. These Requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

2 The observance of the Requirements of this Standard by a manufacturer is one of the conditions of the continued listing of the manufacturer's product under this classification. Underwriters' Laboratories, Inc., however, assumes no responsibility for the effect of such observance or nonobservance by the manufacturer upon the relations between the manufacturer and any other party or parties arising out of the sale or use of the product or otherwise.

3 A product which complies with these Requirements will not necessarily be acceptable if, when examined and tested, it is found to have other features which impair the result contemplated by these Requirements.

4 A product employing materials or having forms of construction differing from those detailed in these Requirements may be examined and tested according to the intent of the Requirements, and if found to be substantially equivalent, may be given recognition.

5 Many tests required by the Standards of Underwriters' Laboratories, Inc. are inherently hazardous. Underwriters' Laboratories, Inc. neither assumes nor accepts any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed, whether performed in whole or in part by the manufacturer, and whether or not any equipment, facility, or personnel for or in connection with the test is furnished by the manufacturer.

6 Requirements are shown in **bold-faced** type and, when necessary, are supplemented by explanatory notes, descriptions of test apparatus and methods, etc., in light-faced type.

REQUIREMENTS

Scope

7 These Requirements cover central station burglar alarm systems intended for use at Mercantile and Banking premises, and on safes and vaults for protection against burglary.

8 A central station system is one in which the operations of electrical protection circuits and devices are signaled automatically to, recorded in, maintained, and supervised from a central station having trained operators and guards in attendance at all times. Central station systems are independently owned, controlled, and operated by a person, firm, or corporation engaged in furnishing such supervised protective signaling service and having no interest in the protected property.

9 These requirements cover the construction, operation, and protection service furnished by a central station, and determine whether a system is classified as Grade B, Grade A, or Grade AA.

10 Regardless of the grade of equipment and protection service determined by this Standard, protective devices installed on individual properties are further classified as to extent of protection at each location. Rules covering installation, classification (of extent), and certification of alarm protective equipment at individual locations are published in the Laboratories' Standard for Installation, Classification, and Certification of Burglar Alarm Systems, which should be consulted by burglar alarm installing contractors.

GRADE B REQUIREMENTS

11 The following paragraphs give the requirements for physical equipment and protection service of Grade B central station burglar alarm systems.

Physical Equipment

Central Station

12 The portions of these requirements relating to the design and construction of appliances are necessarily general in character and are only a partial outline of complete central station requirements. A system which fulfills the conditions herein outlined, and no more, will not necessarily be acceptable.

13 **Central stations shall be provided with adequate fire protection equipment and preferably shall be located in modern fire-resistive structures.**

14 Each central station should have one or more first-aid hand fire extinguishers of approved type. Battery rooms located somewhat removed from the switchboards should have at least one such extinguisher located nearby. Extinguishers should be of a type suitable for use on fires in electrical apparatus.

15 Switchboards should be provided with suitable watersheds permanently installed or with tarpaulins which can be pulled quickly over the equipment if there is possibility of flooding or water damage from sprinkler heads or water pipes located above the apparatus.

16 **Central station operating and guard rooms shall be reasonably protected against entrance and attack by unauthorized persons during the prescribed closed period. Each central station shall have a direct tie-line connection to a police station where possible, or to other fully-manned stations of the operating company, if any, for calling help in an emergency.**

17 **Entrances to central stations shall be kept locked during the closed period and arranged so that positive identification is required of any person seeking admittance.**

18 The arrangement should be such that persons standing outside cannot command a view of the entire interior of the central station. If movable windows front the street at grade level these should be screened or painted. Accessible movable openings in the guard or operating quarters should be covered with iron bars or woven wire mesh guards. Fixed windows need not be covered if equipped with wired glass.

19 Central stations serving less than fifty certificated burglar alarm equipments and occupying joint space in a telegraph or similar office in a prominent street grade location frequented by the public may be considered to be reasonably protected provided that (1) the burglar alarm equipment is either located in the rear portion of the quarters or is separated from the public space by counters and (2) is equipped with police call buttons in addition to a direct telephone connection to police headquarters.

20 **Where the central station dispatches alarms to outside guard stations for answering, there shall be a telephone connection between the two at all times and preferably by a direct tie-line.**

21 **Each central station shall be equipped with a reliable emergency lighting system which can be immediately thrown into service and which shall be independent of the source normally used for lighting purposes.**

22 Gas lights with continuously burning pilots or with automatic igniters are considered suitable for emergency lighting. Candles, kerosene, electric, or other portable lanterns are not considered suitable for the primary emergency lighting system, but are to be recommended where floods, etc., might disrupt power supply for more than 24 hours.

23 **Each central station shall be equipped with one or more reliable clocks, corrected daily against standard time.**

Current Supply

24 **The electrical system shall be supplied with current by one of the following methods:**

25 Supervisory current in central station burglar alarm circuits is normally supplied at low potentials, such as 24 to 60 volts. Where necessary to operate at a central station potential of 60 volts or higher each circuit shall be equipped with current-limiting means, such as suitable fixed resistance, to limit the normal night current in the circuit to approximately 0.040 ampere maximum. In addition, each circuit shall be fused at not more than 1 ampere. Individual lines preferably should be fused at 0.25 ampere at the distribution rack where the circuits leave the central station.

26 Momentary ringing or signaling currents normally supplied at a potential of 110 volts, should not exceed 0.200 ampere either for the day or night positions of the circuit switches.

27 **STORAGE BATTERIES IN DUPLICATE—Storage batteries of suitable type in duplicate sets, each set capable of operating the system for a period of at least twenty-four consecutive hours without recharging are considered acceptable. Batteries shall be installed in an enclosure provided with suitable ventilation and shall be enclosed in such manner that gases or fumes therefrom will not expose alarm devices or other apparatus or wiring to injury.**

Where a fuel oil or gas engine driven generator of ample capacity and acceptable type is provided as an emergency charging source in the event of failure of the commercial power, and is tested at least weekly, the battery capacity may be reduced from twenty-four hours to eight hours without recharging.

Separate battery rooms or enclosures vented to the outside atmosphere, generally will be required only for batteries in unsealed jars where the aggregate capacity at eight hour discharge rate exceeds five kilowatt hours. Unsealed batteries of lesser capacity will not necessarily be acceptable in vaults or small rooms below grade level or in switchboard and operating quarters if there is danger that the maximum concentration of hydrogen will exceed 2 percent of room volume with windows and doors closed or that fumes will do harm to exposed electrical apparatus within the room. Sealed batteries of capacities usually encountered in alarm central stations, especially if on floating or trickle charge, are unlikely to exceed the permissible explosive limit stated above when installed in inhabited operating and switchboard quarters.

Cells shall be suitably insulated against grounds or crosses and shall be substantially mounted in such a manner as not to be subject to physical damage. Racks or frames shall be suitably protected against deterioration.

A reliable source of charging current shall be provided. The charging voltage shall not be over 250 volts.

Charging circuits and boards shall be installed and protected in accordance with the requirements of the National Electrical Code and with such local requirements as may apply.

Batteries shall be protected by enclosed fuses in the main discharging leads.

Suitable provisions shall be made on a switchboard for charging the batteries so that they will be protected from injury due to an excessive rate of charge or to the reversing or interruption of the current; provision also shall be made for shifting the respective batteries from charging to working, and from working to charging, without opening any of the working circuits and so that charging current cannot be accidentally connected to any of the working lines.

STORAGE BATTERY WITH TRICKLE CHARGE (from motor-generators or rectifiers or direct current)—Only such equipment or devices as are especially suited for protective signaling systems shall be installed.

There shall be provided a sufficient number of motor-generators or rectifiers of adequate capacity to supply all circuits without overloading the equipment, with a storage battery of sufficient capacity floating across the line so connected that normally the battery will be charged.

37 The battery shall be of the type specified, and in all pertinent respects except duplication shall be installed and maintained in compliance with the requirements for storage batteries in duplicate.

38 Suitable provisions shall be made on a switchboard for automatically disconnecting the generators, rectifiers, or direct current in case of interruption or reversal of the direct current supply, or breakdown in the motor-generator or rectifier set, and for operating the system from the storage battery. The switchboard, apparatus, and wiring shall conform with the requirements of the National Electrical Code and with such local requirements as may apply.

39 Each rectifier set shall be provided with replacement units for those parts subject to breakage or rapid deterioration. Energy shall be supplied through a transformer from a circuit not exceeding 250 volts and shall be arranged to effectively insulate the rectifier circuit from the current supplying the transformer.

40 Provision shall be made for checking and regulating, within reasonable limits, the voltage supplied to the entire group of working circuits.

41 MOTOR-GENERATOR SETS IN DUPLICATE—Where two independent, constant, and reliable sources of current supply are available, motor-generator sets designed for the purpose may be employed in duplicate, connected to each of the sources, with suitable provision for automatic throw-over from one set to the other, and for the control and regulation, within reasonable limits, of the voltage supplied to the entire group of working circuits.

Electrical Supervision

42 Protection circuit conductors on the equipment and connecting lines to the central station shall form one or more normally closed electric circuits so arranged that a signal will be transmitted to the central station from the effect of an open circuit, a short circuit, ground, or other material change of resistance or current flow in the lines.

43 The circuit arrangement shall be such that any interference therewith, by entry or otherwise, will instantly produce at the central station visual and audible signals of known origin, which shall remain established until recorded and restored by the operator.

44 The failure of any source of energy required to actuate alarm signaling apparatus shall be indicated at once by an acceptable visual or audible alarm signal.

Switchboard, Relays, Signal Devices, Etc.

45 All switchboards, relays, signal devices, and associated apparatus shall be constructed of proper materials, assembled in a workmanlike manner and suitable for the service to which they may be subjected.

46 Switchboards shall be of substantial construction and shall be mounted in a permanent manner where they will be least affected by vibration.

47 Adjustments on relays and similar current-operated devices shall be secured against inadvertent change.

48 Relays, contact switches, and other delicate apparatus shall be designed to afford reasonable protection against dust, moisture, and physical damage.

49 Wires to protective equipments shall be connected through suitable distribution panels with marked terminals to facilitate rapid transfer of a line from defective switchboard units to reserve units when necessary.

50 Reserve units shall be kept at each central station, arranged so that they can be placed in service within one hour.

51 Wiring connections shall be made to terminals with upturned lugs or equivalent, or shall be made mechanically secure and then soldered. Connecting wire shall have current carrying capacity and insulation adequate for the service to which it may be subjected. It shall be neatly laced or cabled and protected against physical damage and abrasion.

Outside Cable System

52 In general, for leased or other wires, standard telephone operating practice will be accepted. For requirements pertaining to protectors on each circuit, aerial or underground, refer to the National Electric Code.

53 UNDERGROUND WIRES—Conductors carried underground shall be grouped in lead-sheathed cables and shall have other mechanical protection.

54 Terminal boards shall be placed and, so far as is practicable, cables shall be run in locations which are normally free of gas leaks from underground systems and which are not exposed to the fire hazard of combustible material stored in the vicinity.

55 OVERHEAD WIRES—Where it is impracticable to place wires underground, the following rules shall be observed:

56 Wires shall be at least equal in conductance and tensile strength to No. 18 Awg copper where single wires are used and to No. 26 Awg copper where cables are used.

57 Single wires carried on poles or in long spans shall be at least equal in conductance and tensile strength to No. 14 Awg hard-drawn copper. Cabled conductors similarly carried shall be at least equal in conductance and tensile strength to No. 19 Awg copper.

58 Wires shall have a suitable insulating covering. Line wires shall have a good covering, consisting of at least two thoroughly saturated and filled braided coverings. Wires in cables shall have suitable insulation and in addition, either a lead sheath or a substantial, filled, braided covering around the several wires. Wires and cables through trees shall be protected with wooden strips or have "tree wire" insulation.

59 Wires run in long spans shall be supported on acceptable insulators at least every 150 feet; so far as possible, they shall run under rather than over electric light and power wires. Special attention should be given to preventing accidental contact with such wires.

60 Service wires from the line to the first point of attachment to the building shall have suitable weatherproof insulating covers and shall be kept free from awnings, swinging signs, shutters, etc. Where wires are carried along the outside walls of buildings, they shall have suitable rubber insulation. If not in rigid conduit, they shall be supported at least every 12 feet on supports to be kept at least one foot from electric light and power wires. Where required, each conductor shall be independently supported on insulators.

Subscriber's Equipment

61 The operating company shall have an established method or methods of protection for common types of construction encountered in the field in which it proposes to operate.

62 Protective wiring on the subscriber's premises shall be installed in accordance with the Standard for Installation, Classification, and Certification of Burglar Alarm Systems of Underwriters' Laboratories, Inc.

63 The wiring shall be connected through an instrument which provides a key and a visual or audible signal device to permit exchange of signals between the subscriber and central station.

64 Delicate apparatus shall be protected against physical damage.

Protection Service

General

65 The operating company shall demonstrate acceptable actual operation of its service for such a period subsequent to submittal of the system to Underwriters' Laboratories, Inc. as may be judged by the Laboratories to be essential for determining the adequacy of the service rendered.

66 The operating company shall comply fully with all provisions of the law relating to the use of overhead or underground wires, within the streets in the territory in which it proposes to operate, as may be necessary to insure reliable service to its subscribers.

Closed Period

67 **The "closed period" shall be the hours during which 25 percent or more of the equipments are closed.**

68 By special permission a specific 12-hour "closed period" may be granted for weekday operation if comprehensive experience records show few, if any, attacks at hours beyond such periods.

Operating Force

69 **The operating company shall have on duty at all times a minimum of one competent operator at each central station, and during the "closed period," as previously defined, the company shall maintain on duty, in addition to operators, at least two employees competent to act as guards. Over and above these minimums, a sufficient number of employees shall be maintained at central stations to receive and investigate troubles promptly and efficiently.**

70 In cities where excellent police co-operation and response is obtainable on burglar alarm calls, a minimum of one guard and one operator on duty during the closed period may be accepted in small Central Stations serving less than 100 listed burglar alarm subscribers, provided that protection service actually rendered is in full accordance with the requirements for the Grade.

71 **The guard and operating forces shall be properly selected, investigated, trained, equipped, and disciplined to insure reliable performance of their duties.**

72 **All employees whose assigned duties require them to enter subscribers' premises after closing shall be bonded by an established surety company.**

73 **Guards shall be at least 21 years of age and able-bodied.**

Average Time to Answer Alarms

74 **For each central station or city in which listed service is considered there shall be determined over a THREE-MONTH PERIOD, the average elapsed time from receipt of an alarm or unauthorized opening until guards arrive at the equipment. This average shall not exceed 15 minutes.**

75 In computing the average elapsed time for a central station, the arrival time shall be understood to be the time recorded by an operator in the central station as a result of a signal given by the guards upon arrival at the premises. Alarms on which the arrival signal is delayed abnormally and is not truly representative of the service may be excluded from the average. These abnormal runs include delays caused by fires, riots, burglary attempts, change in subscriber's key without notification, traffic accidents, cable

breakdowns, no keys, open line or other trouble which prevents signaling, etc. Also included as abnormal runs are prearranged openings where a guard is dispatched to the premises before the receipt of the opening signal.

76 **Individual mercantile premises equipment which cannot be reached in 20 minutes shall not be considered within the range of Grade B service. (Does not apply to vaults and safes.)**

77 Compliance with this provision shall be determined by trial runs under various traffic conditions. Experience indicates a maximum distance of about 7½ miles with automobile runner service.

Guard Equipment

78 **Guards shall be equipped with a pistol or night stick, flashlight, police whistle, identification badge, and with a uniform or cap which readily identifies their company affiliation.**

79 Firearms shall be a necessary part of guard equipment and shall be provided except where pistol permits cannot be obtained for reasons not within the control of the operating company.

Regular Openings

80 **Systems shall be so arranged and operated that the subscriber is reasonably safeguarded against acceptance by the central station of unauthorized or improper opening of the equipment.**

81 **Each connected subscriber at a given location will schedule in writing the time at which he expects to open and close the premises. In addition, the subscriber shall specify those Saturdays, Sundays, and legal and special holidays on which the protection is to remain closed.**

82 **The regular opening time for weekday operation shall not be scheduled more than 30 minutes ahead of the customary opening except where an individual code signal is used on opening.**

83 **All openings prior to the usual or prearranged time shall be investigated. An early opening may be accepted under the reopening provisions of paragraph 90 if not more than 30 minutes in advance of the scheduled opening time or "open period" for the office.**

84 To provide for discrepancies between time-pieces of the subscriber and central station, an opening up to three minutes in advance of the specified hour, if transmitted identically as is the subscriber's customary entrance, may be accepted without investigation.

85 **Regularly Scheduled Sunday and Holiday Openings**—For systems in which the operating routine includes transmission of an individual line code signal by the subscriber, any Sunday or holiday opening made in accordance with a schedule previously filed in writing with the operating company by an authorized representative of the subscriber shall be subject to the ordinary opening procedure in effect on **business days.** Any such opening occurring not earlier than 3 minutes in advance of the regularly scheduled opening time or **not later than the beginning of the "closed period" for that particular subscriber** may be accepted without investigation if accompanied by a correct individual line code signal.

86 For systems in which the normal opening procedure is accompanied by a standardized signal which is the same for all subscribers, Sunday or holiday openings in accordance with schedules may be accepted without investigation if occurring not more than 3 minutes earlier nor 60 minutes later than the scheduled time, provided that the opening routine is normal. Sunday or holiday openings verified by telephone code may be accepted without guard investigation if occurring not later than the regular closing time for the subscriber or for the office.

Irregular and Special Openings

87 This section covers permissible methods of handling certain classes of irregular or special openings which are not classed as alarms or unauthorized openings.

88 The word "Code" as used herein refers to any acceptable secret means of identification, namely, any word, number, or signal which may be issued to an individual subscriber and employed as a means of identifying that particular subscriber by communication of the word, number, or signal over the burglar alarm or telephone line.

89 **Reopenings and Nonscheduled Sunday and Holiday Openings**—When, preparatory to a reopening or to a Sunday or a holiday opening not in accordance with a schedule previously filed with the operating company, a properly authorized representative of the subscriber appears at the central station and is identified by signature, such reopening or Sunday or holiday opening may be accepted without guard investigation provided that it is executed in the normal manner as prescribed for regular openings. Such practice shall also apply to a reopening or a Sunday or holiday opening authorized by the subscriber by letter over the signature of an authorized representative and received by the operating company prior to the opening.

90 Nonscheduled openings by subscribers on Sundays or holidays and reopenings during weekdays up to midnight may be accepted without guard investigation (1) when the correct individual code signal is received without delay and is automatically registered on a suitable printing recorder at the central station, or (2) when the subscriber telephones the central

station of his intention to reopen and is identified by code (over instrument or telephone) immediately following the opening, which shall occur not more than 3 minutes before nor more than 30 minutes after the time specified. An individual time-stamped record shall be kept of each nonscheduled opening so accepted, giving the time of advance notification, name and code number of the subscriber, time of expected opening, time of entry, code verification, etc. The central station operators shall be required to check the code number and name against the authorization filed by the subscriber, and dispatch a guard to investigate if the code signal is incorrect or is delayed more than one minute after opening.

91 When the subscriber telephones the central station of his intention to reopen or to make a Sunday or holiday opening not in accordance with established schedule, and waits outside the premises for the arrival of a guard dispatched from the central station with the signature card before opening, the opening may be accepted without further investigation if accompanied by the correct individual code signal.

92 All Sunday and holiday openings and all reopenings not made in accordance with the above requirements shall be subject to guard investigation.

93 **Scheduled Openings by Watchmen, Janitors, Porters, Etc.**—Special openings or reopenings by watchmen, janitors, porters, etc., or openings to effect change of employee shifts, may be accepted without guard investigation only if made in accordance with the following practice:

94 (a) The opening shall be authorized by the subscriber in writing for a specified time and shall be accepted not more than 3 minutes earlier nor 30 minutes later than the scheduled time.

95 (b) The opening shall be accompanied by correct individual line or telephone code.

96 (c) When the protection is to be immediately reclosed, such closing shall be accomplished as promptly as possible and thereafter the protection shall remain set subject to full alarm investigation service until the next scheduled opening.

97 (d) In leaving premises where the protection has been left unset and in his charge temporarily, the person resetting the protection shall notify the office by signal or otherwise of his intention to leave, after which the company's standard closing routine shall apply.

98 (e) Any departure from the routine described above shall constitute an alarm condition subject to handling in full accordance with requirements of the Standard.

99 **Temporary Openings by Authorized Persons**—It is sometimes necessary to permit persons who have no opening or closing authority, such as window dressers, cleaners, carpenters, etc., to remain on the premises for an unknown length of time after the protection has been set. All such cases shall be properly authorized in writing by the subscriber.

100 The letter of authorization should also include the signature of the person for whom the authorization is intended.

101 When the persons so authorized are prepared to leave the premises, the central station shall be so advised and a guard shall be dispatched to the premises to identify by signature the person in charge and to supervise the reopening and reclosing of the protection.

102 The openings described above should be fully recorded in the central station, giving all details of the occurrence as well as of the investigation.

Closings and Closing Troubles

103 **When a subscriber signals to close, the central station shall promptly return a signal which indicates whether or not the alarm protection circuit is normal.**

104 **If, at closing, trouble exists which cannot be corrected by the subscriber, or if trouble develops upon exit of the subscriber, the operating company shall dispatch a repairman within one hour after the trouble is detected.**

105 **Failure to restore protection for the "closed period" shall require the premises to be guarded, if keys are held, until the subscriber arrives. If keys are not held, the company shall provide a guard for at least one hour if the subscriber agrees to come to the premises.**

106 **Mercantile equipments upon which protective apparatus has not been set at 9:00 P.M. shall be checked each hour thereafter. Bank equipments upon which the protective apparatus has not been set at 7:00 P.M. shall be checked each hour thereafter. Checking, however, may be omitted upon receipt of advice from the subscriber that the equipment will remain open until a specified later hour, at which time checking shall again be made and the closing hour extended when necessary.**

Alarms and Unauthorized Openings

107 **At all times at least one guard, an employee of the operating company, shall be dispatched to answer all alarms or unauthorized openings of equipments which have been duly closed.**

108 **Additional guards shall be dispatched to follow guards from whom no communication is received within a reasonable interval.**

109 Guards shall carry a card indicating the address of the premises, floor on which located, instructions regarding the use of keys, and other information necessary to insure an efficient investigation of the trouble.

110 The character of search to be made shall be governed by whether the premises is classed as a KEY or NO-KEY equipment.

111 A key installation is one for which the operating company holds the necessary keys to permit immediate access of guards from the street to the interior of the protected premises or the premises enclosing a protected mercantile vault, safe, or stockroom.

112 Alarms from KEY installations shall require a complete search of the premises and of such adjacent locations as are accessible.

113 Alarms from NO-KEY installations shall require a complete exterior search of premises by guards who shall remain at the premises if the subscriber, upon being notified, advises that he will arrive within one hour to allow entry.

Identification of Subscribers

114 Upon investigation of all irregular conditions, guards shall obtain satisfactory evidence by means of signatures of identity and authority of the subscriber, his employees, or others found on the premises.

Handling of Subscribers' Keys

115 IN CENTRAL STATIONS—Keys to buildings and subscribers' premises shall be maintained in cabinets under lock and key and access thereto shall remain only with the manager or his authorized assistant.

116 Subscriber's keys shall be kept in individual envelopes under seal of the central station management or an agent of the subscriber.

117 Each sealed key envelope should carry the date when keys were last used. These dates should be checked at least monthly. Upon checking, if the keys have not been used during the past 12 months, they should be taken to premises, tried in all locks necessary to gain admittance to premises, then resealed and dated.

118 A prompt report in writing shall be made to the subscriber of every occasion when key envelope seals are broken.

119 Subscriber's keys kept at an outside guard station shall be kept in a strong container fitted with an acceptable lock. Such keys after use shall be returned to the central station for checking and resealing within 24 hours. All keys, whether used or not, shall be checked by the manager or his authorized assistant at least weekly.

The names and addresses of subscribers shall not appear on key envelopes kept in guard stations or central stations.

Records

Accurate records of the service of each central station, including time of receipt of alarms, names of guards, time dispatched, time guards signal in, nature of alarms, regular and special opening time of each subscriber, actual time of opening and closing each day, the names of persons entering the premises during the "closed period" under authority of subscribers, and the use of keys held by the operating company, shall be kept for at least one year.

All such entries shall be made in ink or indelible pencil.

Complete records of repairs, adjustments, replacements, or additions made to equipments on premises and of regular maintenance inspections, shall be kept for at least one year.

Maintenance

Systems maintained upon subscribers' premises shall be thoroughly inspected once each year under maintenance contract to determine that all parts are in proper working order, a complete report thereof being retained on file.

GRADE A REQUIREMENTS

125 Central station burglar alarm systems to be classified as Grade A shall comply with Grade B requirements, outlined in the preceding section, and shall, in addition, comply with the following requirements pertaining to equipment and operation of service.

Physical Equipment

Electrical Supervision

126 The circuit to each protective equipment shall be arranged to provide a method of determining at the central station the current flow, or to obtain a reading indicative of resistance in the individual circuit.

127 A milliammeter, galvanometer, or similar instrument connected in each subscriber's switchboard unit and continuously in the circuit is the preferred method of complying with this requirement. A milliammeter common to each switchboard section and provided with a flexible cord and plug or switching key so that it may be quickly connected into each line circuit is considered acceptable, provided that current readings are taken in each line at least once a night.

128 Periodic tests of operability of alarm registering units shall be made at intervals not exceeding three hours during the "closed period."

Subscriber's Equipment

129 The device used by the subscriber to receive signals from the central station at closing time shall give distinct audible or visual signals which will attract the subscriber's attention upon closing the premises.

130 The permanent wiring on the protective equipment shall be supervised during the day or "open period" by a closed-circuit connection to the central station.

Protection Service

Operating Force

131 The operating company shall have on duty at all times, over and above the minimums specified for Grade B, a sufficient number of employees to receive and investigate troubles promptly and efficiently, as specified in subsequent paragraphs.

Average Time to Answer Alarms

132 For each central station or city in which listed service is considered, there shall be determined over a three-month period, the average elapsed

time from the receipt of an alarm or unauthorized opening until guards arrive at the equipment. This average shall not exceed 10 minutes.

133 **Individual mercantile premises equipments which cannot be reached in 15 minutes shall not be considered within the range of Grade A service. (Does not apply to safes and vaults.)**

134 Compliance with this provision shall be determined by trial runs under various traffic conditions. Experience indicates a maximum distance of about 5½ miles with automobile runner service.

Number of Guards Dispatched

135 **During the "closed period," as previously defined, two guards shall be dispatched to answer all alarms or unauthorized openings of equipments which have been duly closed. One guard shall be an employee of the operating company and the other guard may be either an employee of the operating company or a duly authorized representative of the local police department.**

136 Alarms received during the "open period" of the office may be investigated by one guard.

Irregular and Special Openings

137 Permissible methods of handling **Irregular** and **Special Openings** as described in the Grade B requirements apply also to Grade A service. The following paragraphs apply especially to Grade A service.

138 On all daily or regular scheduled openings where the opening signal is received from 3 to 15 minutes in advance of the scheduled opening time, the opening may be investigated by a single roundsman provided that it is otherwise normal. However, dispatch of guards shall not be delayed awaiting receipt of the correct signal.

139 **An opening alarm received after the subscriber's authorized opening time and not later than 5:00 P.M. on the day authorized, if identical with his customary entrance except that the code signal is confused or incorrect, is classified as "wrong signal" and may be answered by one guard.**

140 If conditions specified in paragraphs 87-102 inclusive for acceptance of **Irregular** and **Special Openings** without guard investigation are not complied with fully, but the central station partially identifies the person entering, one guard investigation shall be considered acceptable.

GRADE AA REQUIREMENTS

141 The following requirements pertain to direct wire central station burglar alarm systems which incorporate refinements in electric apparatus and circuit arrangement, supported by operating practices and reserves more elaborate than may be necessary or practicable for every community or class of risk.

142 Grade AA systems referred to above are designed especially for use in districts or on types of premises which, because of location, concentrated values contained, character of merchandise, or other factors, may attract a more scientific or highly skilled burglarious attack or warrant a higher degree of reliability.

143 **Central station burglar alarm systems, to be classed as Grade AA, shall comply with all Grade A requirements relating to electrical equipment and protection service and shall comply with additional requirements as given in the following paragraphs.**

Physical Equipment

General

144 **The subscriber's unit, switchboard units, local signaling devices, time stamps, and other important electrical apparatus shall be of a design which has been expressly examined, tested, and found suitable for this special class of central station service.**

145 **Electrically controlled time stamps synchronized to a master clock which is corrected at least daily to standard time shall be used for the recording of all time entries in connection with the investigation of alarms, openings, and closings. Time stamps shall be provided in sufficient number to insure prompt recording.**

146 **Central stations shall be located in buildings of modern fire-resistive construction.**

147 **Central station operating and guard rooms shall be fully protected against entrance and attack during the "closed period."**

148 **The company shall maintain in operation a minimum of two completely manned, mutually accessible central stations.**

149 Stations shall be considered mutually accessible if runners can normally reach one station from the other in an elapsed time of 15 minutes.

150 **Each central station shall be interconnected with at least one other central station by means of an emergency signaling system. In cities having more than two central stations each station shall be so connected to its most accessible neighbor.**

151 **Where a central station dispatches alarms to outside guard stations, the two shall be interconnected by a direct tie line.**

Subscriber

132 The device employed at the subscriber's premises to receive signals from the central station shall produce audible or a combination audible and visual signal with provision for positively notifying the subscriber in the event that the protective circuit is not in proper operating condition at closing time.

133 All apparatus such as bells, buzzers, relays, electro-mechanical signaling units, and terminals for protective circuit divisions, shall be contained in substantial enclosures which offer protection against dust, physical damage, and tampering.

Electrical Operation

154 Each subscriber's line circuit shall include in the switchboard at least one unit responsive to an increase in the current, one unit responsive to a decrease in the current, and one accurately graduated meter, or a similar instrument, to give a constant visual indication of the current or resistance in the protective circuit.

155 Where the alarm-indicating devices are electrically operated by contacts on the main line current increase and decrease detecting units, such local circuits shall be under continuous electrical supervision. If at least two main line current increase and two main line current decrease detecting units are provided, the local contacts may be of the nonsupervised or normally open circuit type.

156 The system shall be so designed, constructed, and adjusted as to permanently establish an alarm registration at the central station which cannot be restored except by the operator on duty in the event of any of the following disturbances:

157 (a) An increase in the line current of 40 percent over the normal value.

158 (b) A decrease in the line current to 60 percent of the normal value (40 percent decrease).

159 Where two independent sets of main line current increase and decrease detecting units are employed, one set shall be adjusted to the values given above in (a) and (b), but the other set shall not be required to respond to changes of less than 60 percent from the normal current.

160 (c) The shunting of the incoming line to the premises with a resistance equal to that of the protection circuit within the premises.

161 The system shall be so designed and individual subscriber's circuits shall be so adjusted as to reduce to a minimum the possibility of failure of a signal to be transmitted to the central station under the following practical circuit conditions:

162 (a) The operation of any attached openings while a foreign high resistance exists in the incoming protective circuit or cable connecting to the central station.

163 (b) A low or high resistance "leak" or "escape" across the two protective circuits of opposite polarity, followed by a "break" in the main line protective circuit beyond the leak (i.e., at the most remote point on the circuit from the central station).

164 An alarm condition on any subscriber's line shall be manifested by at least three major signals in the central station, as follows:

165 (a) A visual signal common to each board section or position.

166 (b) An audible signal common to each board section or position.

167 (c) Individual visual signal for each switchboard line instrument.

168 Pilot lamps are considered acceptable visual signals for (a) above and for (c) when in duplicate. Pilot lamps, where employed, shall not be depended upon to complete electrical circuits actuating other signaling devices excepting that when local visual and audible signals are in duplicate throughout, one of the duplicate sets may be so actuated. Connection of two pilot lamps in parallel shall not be considered as eliminating or modifying this requirement.

169 The system shall operate so that opening any movable unit at protected premises will produce an alarm that will be permanently established at the premises, even though the cause thereof is removed, and that cannot be restored except by the operator at the central station or by operation of the subscriber's unit by an authorized representative of the alarm company.

170 The locking-in feature specified in the preceding paragraph shall be independent of and in addition to the locking-in action obtained at the central station.

171 The main line underload and overload relay adjustments shall be so arranged that they cannot be manipulated by the operating force to provide a lower degree of sensitiveness than that specified in preceding paragraphs.

172 Each switchboard instrument shall be equipped with individual signaling and operating keys. Where switches are employed for silencing individual local signals, a prominent visual indication must remain permanently on the instrument so long as its local signal is disconnected, and the disconnection shall not affect the reception of signals from other lines.

The system shall be so designed that spare switchboard units may be substituted quickly for defective units in such a manner that the identity of the circuits being served by the substitute units is positively indicated.

Signals to the subscriber at openings and closings shall be of the audible type, and shall provide for notifying the subscriber in the event that, at closing, electrical trouble exists on the protective circuit.

Each line circuit shall provide for electrical test by the central station operator during the "closed period." These tests shall give the following positive indications at the central station:

(a) That the protective circuit at the premises has not been bridged out or replaced by a dummy resistance, even though identical in value to the complete subscriber's circuit.

(b) That the operating adjustment or calibration or both of at least one main overload unit and one main underload unit are within the specified limits, that the main overload units respond to that current change produced by a cross or ground in the protective circuit at the subscriber's premises, that the main underload units respond to a break in the line, and that all associated local signals are in normal operating condition.

The test may be accomplished at the central station by applying an increased potential, a current of reversed polarity, or an alternating current to operate an electrical or an electro-mechanical device in the subscriber's premises or some equivalent method which will return a distinctive signal to the central station, positively indicating its operation.

Organization

The burglar alarm company shall be an established organization of recognized standing and demonstrated stability.

Service Record

Systems, to be eligible for classification as Grade AA, shall be listed as Grade A at the time of application. They must then demonstrate for a period of at least one year suitable proficiency under the intent of the higher requirement.

Protection Service

Guards shall be completely uniformed.

Guards and repairmen shall be equipped with hand telephone sets and with tools and necessary testing equipment to facilitate emergency repairs and adjustments.

183 All guards normally dispatched to answer alarms shall be regular employees of the operating company.

184 The operating company shall maintain on duty during the closing period, in addition to the operators required, a minimum of three regular guards in each central station. Men in remotely located guard stations shall not be considered as part of the personnel of any central station in compliance with this requirement.

185 For each central station district the average elapsed time to answer alarms from mercantile establishments shall not exceed seven minutes. Not more than ten percent of the individual runs made shall show an elapsed time in excess of seven minutes. Individual mercantile protective equipments which cannot be reached in ten minutes shall not be eligible for certification under this Standard.

186 The average elapsed time to answer alarms from installations on safes shall not exceed ten minutes. Not more than ten percent of the individual runs made shall show an elapsed time in excess of ten minutes. Individual safe installations which cannot be reached in 15 minutes shall not be eligible for certification under this Standard.

187 The average elapsed time to answer alarms from bank vault installations shall not exceed 15 minutes. Not more than ten percent of the individual runs made shall show an elapsed time exceeding 15 minutes. Individual bank installations which cannot be reached in 20 minutes shall not be eligible for certification under this Standard.

188 The operating company shall maintain a record of standard time allowances required for guards to reach subscribers' premises. Additional guards shall be dispatched to follow guards from whom no signal has been received within an interval five minutes greater than the standard time allowance established for the individual installation.

189 The elapsed time in answering an alarm shall be considered as the interval elapsing between the first registration of the alarm signal at the central station and the receipt at the central station of the guard's signal transmitted from the subscriber's set within the premises.

190 Average elapsed time records shall be computed from original alarm records, and all cases where the guard's signal was delayed by causes beyond the reasonable control of the operating company shall be excluded from the average.

191 Included in such reasonable exceptions will be delays caused by the interruption of the line circuit, entrance delayed or prevented by firemen, policemen, or others authorized, changing of door locks by subscriber without notification to the alarm company, etc.

192 **Each month the operating company shall submit to Underwriters' Laboratories, Inc. a report covering protection service performance for each of its central stations. Such reports shall show the total number of alarms answered, average elapsed time, number of alarms answered by less than required number of guards, number of delayed runs excluded for authorized reasons with the reason for each exclusion, and all burglaries or attempted burglaries with results in full for each case.**

193 It shall be understood that the Reexamination Service of Underwriters' Laboratories, Inc. shall serve to check frequently from original alarm records the validity of such reports, averages, and exclusions.

Operating Routine

194 **Subscribers desiring to close premises shall not be given the closing signal until the switchboard operator has tested the alarm and found it in normal condition.**

195 **All alarms shall be tested as specified in preceding paragraphs at least every four hours during the "closed period." Failure of any equipment to respond normally to such tests shall be considered an alarm condition and be investigated as such.**

196 **Each subscriber shall have an individual code signal which must be properly transmitted to the central station at opening. Failure of a subscriber properly to transmit such code signals shall be construed as "wrong signal" and be answered by at least one guard, provided the occurrence is at normal opening time. Such cases occurring at other than normal opening time shall be considered as alarm conditions.**

TRANSMITTER SYSTEMS

General

197 A transmitter system is one employing a code transmitter at the protected premises arranged so that more than one subscriber can be serviced from the same central station circuit.

198 Transmitter systems complying with the following requirements are eligible to receive a listing of Grade B central station alarm only.

199 **Each subscriber's premises shall have at least one code transmitter. Not more than 15 code transmitters may be connected in any one central station circuit, and each transmitter shall give an individual signal different and readily distinguishable from that of any other transmitter on the same central station circuit.**

200 Police call transmitters may be connected to central station circuits serving transmitter-type burglar alarm systems, provided that the number of police call transmitters does not exceed 20 on any one circuit. Where such police call units are used, the number of burglar alarm transmitters on the circuit shall be reduced in the ratio of one to ten; that is, for every ten police call transmitters, the maximum number of 15 burglar alarm transmitters permissible under the Standard shall be reduced by one. The maximum transmitter load for any one circuit with a combination of the services mentioned would thus be 13 burglar alarms and 20 police call transmitters.

Protection Service

201 **The protection service shall comply in all respects with the requirements for Grade A central station systems, except that the maximum elapsed time limit on individual mercantile premises equipment shall be 20 minutes, as specified in paragraph 76 for Grade B certification.**

202 In determining the elapsed time of a station serving both Grade A and Grade B certificated equipment, it shall be permissible to analyze the two grades of systems separately. However, when this method of analysis is followed, all Grade B equipments, both direct wire and transmitter, shall be combined in determining conformity with Grade B elapsed time requirements.

Physical Equipment

Subscriber's Equipment

203 **The protective wiring, conductors, and attachments at subscriber's premises shall comply with the Standard for Installation, Classification, and Certification of Burglar Alarm Systems of Underwriters' Laboratories, Inc.**

204 Connection between the subscriber's protective wiring and the central station circuit shall be effected by means of a code transmitter. The arrangement shall be such that placing the subscriber's equipment in the closed position will transmit a ''closing'' signal, after which any disturbance thereof will immediately set in operation the code transmitter, thereby signaling the central station.

205 TRANSMITTERS—The transmitting mechanism shall be enclosed in an electrically protected cabinet equivalent to that required on Grade A Mercantile Local Burglar Alarm Systems.

206 The transmitter shall operate so that in the event of disturbance of the subscriber's protective circuit, the code signal transmitted to the central station shall be repeated not less than three times for a disturbance 30 seconds or longer in duration. At least one code signal shall be transmitted for each disturbance 15 seconds or less in duration.

207 The system shall be designed so that either an hourly automatic test signal is transmitted from each subscriber's premises during the ''closed period'' or the central station operator can cause each transmitter to send in a test signal at will.

208 Where central station lines enter the premises in underground cables or where these lines enter and leave the premises at separate points at least 10 feet apart with the subscriber's protective circuit run with the central station line to the nearest junction, to guard effectively against severance of both lines simultaneously, hourly test signals shall not be required.

209 The foregoing test signals shall supervise both the subscriber's protective circuit and the connection between the central station line and the transmitting mechanism.

210 Electrically operated transmitters shall be provided with supervision over both their source of energy and their propelling mechanism.

211 Spring-wound or mechanically operated transmitters shall be provided with supervision over the wound condition of the mechanism.

212 Winding keys projecting outside of the case shall be designed so that it is not possible to apply reverse rotary pressure and stop the mechanism before one complete round of the code signal is sent in.

Central Station Circuit

213 The central station circuit shall be of closed circuit type. Signals from the transmitters shall normally be effected by opening this circuit.

214 The central station circuit arrangement shall be such that a single break in the line will not prevent the reception of signals from any subscriber on that circuit.

872

215 The central station circuit shall be arranged so that a single ground on the line will not prevent the reception of signals from any subscriber on that circuit.

216 The central station circuit arrangement shall be such that either a break or ground thereon will instantly cause a signal at the central station which will call the operator's attention to and identify the nature of the trouble.

Central Station Equipment

217 Central station physical equipment shall comply with the requirements for Grade A central station burglar alarm systems when not inconsistent with the following additional requirements:

218 SWITCHBOARDS, RELAYS, SIGNAL DEVICES, ETC.—All switchboards, relays, signal devices, and associated apparatus shall be constructed of proper materials assembled in a workmanlike manner and suitable for the service to which they may be subjected.

219 Relays employed for closing the local circuits of recording instruments may be of the telegraph type and are not required to be enclosed.

220 RECEIVING INSTRUMENTS—Code signals shall be received on tape registers or other suitable recording instruments of listed construction or the equivalent. There shall be at least one recording instrument for each central station line circuit and the records shall be printed either in ink or by some method of equivalent permanence.

221 SUPERVISORY SIGNALS—An audible supervisory signal shall be provided to sound during the time a code signal is being received. This signal may be common to not more than ten central station line circuits.

222 Each central station line circuit shall be provided with a visual supervisory signal which shall indicate during the time a signal is being received from any equipment on its circuit. The arrangement shall be such that the circuit from which the signal is being transmitted may be identified instantly.

223 A visual supervisory signal should also indicate whenever the circuit is being operated with a break, ground, or other temporary fault.

COMBINATION TRANSMITTER AND LOCAL SYSTEMS

Combination systems are systems which are provided with an outside sounding device at the subscriber's premises and which, in addition, employ a code transmitter to send signals to the central station in the event of disturbance of the protective circuit or operation of the local sounding device.

Combination systems connected to a Grade A central station shall receive the classification of Grade A central station.

Combination systems connected to a Grade B central station shall receive the classification of Grade B central station.

Combination systems to be eligible for listing shall, insofar as the local installation is concerned, comply fully with the standard requirements for Grade A local burglar alarm systems.

Combination systems to be eligible for listing shall comply with all the requirements in the foregoing section pertaining to transmitter systems with the exception that hourly test signals shall not be required.

CERTIFICATION OF INSTALLATIONS

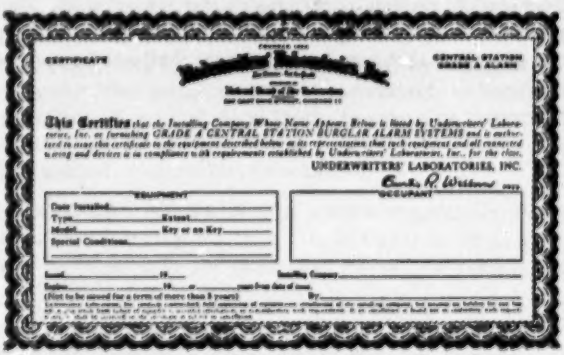
Reexamination and Certificate Service

229 Listed system installations may be identified as to type, grade, and extent of protection by a certificate of the form shown in paragraph 231. Supervision by Underwriters' Laboratories, Inc. extends only to those installations which have an unexpired certificate.

The Certificate

230 The certificate is issued by Underwriters' Laboratories, Inc. upon receipt of an acceptable report from the listed company or is issued by the listed company, depending on the class of product involved. Certificates indicate the class of equipment, the extent of protection, location of the equipment, period covered by the certificate, and name of the installing company.

231



CERTIFICATE

CENTRAL STATION GRADE A ALARM

This Certifies that the Installing Company Whose Name Appears Below is listed by Underwriters' Laboratories, Inc. as furnishing GRADE A CENTRAL STATION BURGLAR ALARM SYSTEMS and is authorized to issue this certificate to the equipment described below as its representation that such equipment and all connected wiring and devices is in compliance with requirements established by Underwriters' Laboratories, Inc., for the class.

UNDERWRITERS' LABORATORIES, INC.

EQUIPMENT

Date Installed

Type Extent

Model Key or no Key

Special Conditions

OCCUPANT

Issued 19

Installing Company

Expires 19 or years from date of issue.

(Not to be issued for a term of more than 3 years)

By

Certificate for Grade A Central Station Burglar Alarm Systems

232 The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field countercheck program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

233 Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements.

234 Inspections and tests conducted by the Laboratories' inspectors at factories cover the design, construction, and wiring of all essential units employed in the system. Particular attention is given to electrical insulation, spacings, contacts, wiring, and other items bearing upon the reliability of operation and protection against tampering.

Field Inspections

235 Inspections and tests of representative installations in the field are made to determine the correctness of installation of protective devices and wiring, quality of workmanship, operability of circuits, maintenance, and extent of protection applied.

236 Periodic inspections and tests at central stations are conducted by the Laboratories' inspectors to verify the condition, adjustment, and operability of electrical equipment, the handling of subscribers' keys, and the adequacy of station personnel and records. Records at each central station are reviewed for representative periods on certificated equipments with respect to items such as average elapsed time in responding to alarms, number of guards dispatched, supervision of subscribers' daily openings and closings, reopenings, and any other irregularities occurring on protected properties.

237 The correctness of central station records covering protection service is further verified by "surprise night tests," created on protective circuits at times unknown to the station operators. The elapsed time, number of guards sent, and character of response to these surprise tests are observed and subsequently compared against records at the central station.

Correction of Defects

238 **Should the reexamination disclose that important changes have been made in the design and construction of listed equipment, the manufacturer is required to resubmit the equipment for examination, test, and report by filing application and making payment of a preliminary deposit at the time of resubmittal. Failure to do so within 30 days after having been duly notified shall be cause for suspension of the certificate privilege or withdrawal of listing.**

239 **Should the reexamination disclose individual installations which do not conform to the Standard or with a Reexamination Procedure applicable to the case, the manufacturer-installer is required to correct such installations within 30 days after having been notified of the defects requiring correction. Serious defects in operation are to be corrected immediately.**

240 **Should the reexamination disclose failure to respond to night service tests or failure to comply with requirements of the Standard respecting elapsed time, number of guards on duty and other important operating practices, the central station shall be subject to special investigation and may be required to file an application authorizing extra studies of the service. If during the special investigation of a central station over a three-month period, the necessary improvement is not shown, the certificate privileges may be suspended, or listing may be withdrawn.**

241 The special investigation is concluded when, in the opinion of the Laboratories, the conditions responsible for the special investigation have been corrected.

242 All costs incident to special investigations, over and above the normal cost of operating the service, are billed to the manufacturer-installer.

IN THE UNITED STATES DISTRICT COURT

GOVERNMENT EXHIBIT NO. 4

FOUNDED 1894

Underwriters' Laboratories, Inc.®

For Service - Not for Profit

SPONSORED BY

National Board of Fire Underwriters

ACCIDENT, AUTOMOTIVE, AND BURGLARY PROTECTION EQUIPMENT LISTS

September 1961

878

LISTS RELATING TO

Accident Equipment

(Page 9)

Automotive Equipment

(Page 63)

Burglary Protection Equipment

(Page 81)

September, 1961

These Lists include all listings up to September 1, 1961, and replace all similar Lists and Supplements of earlier dates.

Use the Index on pages 128 to 130 incl.

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OFFICES AND TESTING STATIONS

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161 Sixth Avenue, New York 13, N. Y.
1655 Scott Blvd., Santa Clara, Calif.

Representatives and Inspectors throughout the United States

Published by Underwriters' Laboratories, Inc.

879

INTRODUCTION

IMPORTANT INFORMATION FOR USERS OF THESE LISTS

Underwriters' Laboratories, Inc., chartered as a nonprofit organization, aintains and operates laboratories for the examination and testing of de-ces, systems, and materials as to their relation to life, fire, and casualty zards, and crime prevention. Founded in 1894, the enterprise is spon-red by the National Board of Fire Underwriters. It is operated for rvice, not for profit.

ain Office and Testing Station of Underwriters' Laboratories, Inc. at Chicago

Four testing stations are maintained for the conduct of investigations: he main office and testing station at Chicago, and branch offices and test-g stations at Northbrook, Ill., New York, N. Y., and Santa Clara, Calif.

The Northbrook office and testing station at 2550 Dundee Road, Box 47, is equipped for the examination and test of gas and oil equipment, urglary protection equipment, sprinklers and first-aid fire protection ap-liances, and signaling apparatus.

The New York office and testing station is in the Butterick Building, 61 Sixth Avenue. An adequately equipped laboratory is provided for the xamination and test of electrical equipment and fire alarm and signaling pparatus.

The Santa Clara office and testing station, at 1655 Scott Blvd. is equip-ed for the examination and test of electrical equipment and products n some other classifications.

Offices and representatives of Underwriters' Laboratories, Inc., con-erned with maintenance of the Inspection Services described below, are situated in some 200 cities throughout the United States.

Reports on devices included in these Lists may be referred to one or ore Councils for review prior to release. The Councils and their mem-ers are listed on the opposite page.

ENGINEERING COUNCILS OF UNDERWRITERS' LABORATORIES, INC.

Automotive Council

G. E. Manning, Chicago, *Chairman*

J. L. Erhardt.....New York
A. Leslie Ham.....Montreal
J. P. Healy.....Chicago
H. S. Omsberg.....New York
F. J. Sauter.....Chicago
A. E. Spottke.....Skokie, Ill.

Burglary Protection Council

H. B. Whitaker, New York, *Chairman*

H. E. Foos.....Baltimore
A. R. Fromm.....Baltimore
J. H. Glinsmann.....New York
I. J. Hemingway.....Hartford
A. K. Layden.....Chicago
T. McDowell.....Glens Falls, N. Y.
H. B. Michael.....Chicago
James H. Murphy.....New York
D. D. Pillsbury.....New York
C. R. Young.....New York

Casualty Council

G. E. Manning, Chicago, *Chairman*

F. H. Cahoon.....Albany
Chas. R. Chace.....Hartford
F. J. Drogosch.....Detroit
J. H. Fluker.....Columbus, Ohio
R. L. Forney.....Chicago
E. R. Granniss.....New York
Robert Hagopian.....New York
Roger Ostrem.....Madison
M. J. Pitre.....New York
Charles Sherman, Jr.....New York
J. W. Strassberger.....New York
D. G. Vaughan.....Hartford

Electrical Council

K. S. Geiges, Santa Clara, *Chairman*

R. B. Boyd, Jr.....Raleigh
L. S. Bush.....San Francisco
E. E. Carlton.....San Francisco
L. M. Christensen.....Salt Lake City
A. G. Clark.....Los Angeles
S. Cowan.....Charlotte
M. G. Folkes.....Richmond, Va.
J. A. Graham.....San Francisco
D. H. Hansen.....Oakland
B. A. Hartley.....Chicago
W. P. Hogan, Jr.....Chicago
D. L. Johnson.....Atlanta
C. A. Klawa.....Portland
A. Lagadinos.....Boston
F. Marcellino.....New York
R. G. Pullen.....Indianapolis
C. E. Schaad.....New York
C. J. Shukes.....Chicago
W. E. Stewart.....St. Louis
S. Martin Streed.....Minneapolis
R. E. Ward.....Nashville
Joseph Whitner.....Atlanta

Fire Council

G. E. Manning, Chicago, *Chairman*

W. C. Anderson.....St. Louis
L. E. Antene.....Oklahoma City
A. H. Baum.....St. Louis
A. J. Benline.....New York
A. S. Briggs.....Dallas
L. S. Bush.....San Francisco
George W. Clarke.....Seattle
E. H. Doane, Jr.....Chicago
H. J. Elbourn.....Indianapolis
W. K. Estep.....Pittsburgh
W. H. Forristall.....Hartford
E. W. Fowler.....New York
A. W. Gilbert.....San Francisco
C. D. Griffin.....Los Angeles
Carlyle H. Hill.....Philadelphia
John Hommes.....Chicago
P. H. Kesselring.....Detroit
D. M. Lathers.....New York
S. Gage Lewis.....Newark
L. S. Miller.....Chicago
J. W. Morris, Jr.....Atlanta
E. C. Niver.....New York
W. L. Phelps.....Milwaukee
E. F. Reske.....Chicago
C. J. Setzer.....Columbus, Ohio
A. J. Snow.....Portland, Ore.
R. H. Stocker, Jr.....Boston
W. L. Sundstrom.....Chicago
J. L. Thompson.....Louisville

A booklet, "Testing for Public Safety," will be furnished upon reques This describes the organization, purposes, and methods of Underwriter Laboratories, Inc., including instructions for submittors, method o charging for work, follow-up programs, etc.

A pamphlet, "Three Safety Films," is available on request. This pamphle describes the three 16-mm sound films that may be obtained, on a fre loan basis, from Chicago, New York, or Santa Clara testing stations.

The following are the Underwriters' Laboratories' Lists of Inspecte Equipment and their issue dates:

Building Materials	**January**
Fire Protection Equipment	**January**
Electrical Appliance and Utilization Equipment	**May**
Electrical Construction Materials	**May**
Hazardous Location Equipment	**May**
Accident, Automotive, and Burglary Protection Equipment	**September**
Gas and Oil Equipment	**November**
Bi-Monthly Supplements to All Lists	**Beginning February**

881

CONTENTS

This publication contains three Lists, viz., Accident Equipment; Autootive Equipment; and Burglary Protection Equipment. Each List conains summaries of general information cards and of Listing Card Reorts in effect at date of publication.

Primarily, Underwriters' Laboratories, Inc. is concerned with the casuty and crime features of equipment, materials, devices, appliances, or ystems covered by this List and not with any other features, such as ossible physiological effects or characteristics, which ordinarily fall within he jurisdiction of duly constituted authorities. Where Underwriters' Labotories, Inc. is aware of the probability of hazards resulting from such ther features, not in its opinion likely to be well known or clearly underood by the user, it requires, as a prerequisite of listing, that the manuacturer provide with each device, instructions as to limitations of use. The general information section of this List preceding each classification akes reference to such hazards and instructions.

Users of these Lists are urged to read carefully the following sections n Installation and Use, Follow-Up Program, and How to Use the Lists, or an understanding of the extent of the services of Underwriters' Labratories, Inc., and of the limits of its responsibility. See also the genral booklet, "Testing for Safety," mentioned above.

Listing Card Reports: Listings are promulgated initially on printed ards filed according to classification and guide number, as indicated at ach individual heading in these Lists, and cabinets containing these cards re maintained at the offices of the principal boards of underwriters and nspection bureaus in the United States, at many of the general offices of nsurance companies and firms, in certain federal, state, and municipal epartments, and at offices of the Laboratories and at the headquarters of s representatives in many of the larger cities. A copy of the Listing ard is also forwarded to the submittor, and he may obtain additional opies at cost of printing. Interested persons desiring to receive all Listng Cards as issued may subscribe to this service at an annual charge to over printing and mailing costs.

For convenience in reference, the listings are arranged alphabetically as o subject and alphabetically by name of listee under each subject.

Records of favorable reports issued after publication of this List and of ithdrawals of devices, materials, and systems from the Lists will be ound at the offices and with the representatives and inspectors of the aboratories in various cities as mentioned above. In addition, Listings ubsequent to this annual combined List will appear in the Bi-Monthly upplement next succeeding issuance of the reports.

Examinations and tests of products submitted for Listing are in genral based upon the applicable provisions of nationally accepted safety r other codes and upon installation and classification requirements of nsurance organizations including the National Bureau of Casualty Underwriters and (for automotive appliances) the National Automobile Underwriters' Association.

The label or listed marking on a product is evidence that such product as been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same lassification are necessarily equivalent in quality or merit.

INSTALLATION AND USE

Local authorities having jurisdiction should be consulted in all cases s to the particular requirements covering the installation and use of he devices and materials listed.

FOLLOW-UP PROGRAM

GENERAL

Upon the issuance of a report, the promulgation of Listing is contingent pon the establishment of one of the several forms of follow-up service riefly described in the following sections. The selection of the service

487

to be applied to a particular class of product rests with the Laborato and is uniform for all Listings within each classification.

The follow-up program is designed to serve as a formal check on supervision which the manufacturer exercises to determine compliance the product with the applicable requirements of the Laboratories. Exp ence has shown that a program of this nature can be operated efficie under the direction of Underwriters' Laboratories, Inc., without cal upon the manufacturer to give undue publicity to his manufacturing p cesses or subjecting him to unwarranted production delays.

Manufacturers, inspection authorities, and others are encouraged report to the Laboratories complete details concerning features of Li products thought not to be in compliance with applicable requireme The Laboratories is prepared to undertake prompt and thorough inve gation of such reports and, if the features involved are not in compli correction of subsequent production is required as a condition of contin Listing and Service.

The appearance of a Listee's name in this List does not signify that of his products in the classification are covered by the Laboratories' serv The following sections describing the various services include instructi for identifying the portion of any Listee's output covered by the serv

Underwriters' Laboratories, Inc. is established for service, not pr Accordingly, the charges for the follow-up program are adjusted fr time to time, and subscribers to the service are notified of the cur charge and any subsequent changes.

These services represent in any case only the independent judgment Underwriters' Laboratories, Inc., given with due consideration of necessary limitations of their practical operation and in accordance w the declared objects and purposes of the Laboratories. Underwrite Laboratories, Inc. neither assumes nor accepts responsibility for the eff of these services, reports, listings, requirements, and labeling on relati between manufacturers or others, or on the sale of products, nor Underwriters' Laboratories, Inc. guarantee that its findings will be cepted or recognized in any individual case. Such assurances can be tained only from the authority having jurisdiction.

REEXAMINATION SERVICE

General — This service involves visits to the factory, one or more tim yearly, by a member of the Laboratories' staff, for the selection, exa ination, and test of representative samples of the most recent producti of the listed product, together with the listing of such product in t published records of Underwriters' Laboratories, Inc. If in such exa ination and/or test unacceptable features are found, these features are be corrected by the manufacturer in subsequent production as a conditi of continued listing.

Identification — Products Listed under the Reexamination Service a marked with the Listee's identification and catalog designation, or t equivalent, which correspond with the marking shown in the Laboratori published records.

Appearance of a Listee's name under a particular classification in the Lists does not signify that all his products of that classification are Liste Only those devices and materials which actually carry the special desi nation or marking shown in these Lists are covered by the Reexaminati Service.

Symbols called "Reexamination Service Markers" to appear on nam plates or on tags or containers under specified conditions are employe in some cases to supplement the required means of identification. Su markers do not necessarily appear on all devices which are Listed und Reexamination Service. The use of the specified markings for Reexam ined products is the manufacturer's assertion that they are Listed, an does not in any way waive requirements relative to the identificati marking referred to above.

Cost — The cost of the Reexamination Service is defrayed by annual fe (ranging from $50 upwards) established for each Listed classification.

tion, if the Reexamination discloses features not in compliance with the irements, such items are to be corrected by the manufacturer on sub- ent production as a condition of continued Listing, and the charges rred by the Laboratories in determining that such corrections have made will be billed to the Listee.

sting by Report: Certain products or devices listed under one of the ral types of Follow-Up Service are recorded as "Listed by Report." description of such product or device, with an account of the exam- on and tests made by Underwriters' Laboratories, Inc., and the con- ons derived therefrom, are contained in a report filed by client num- and date as noted in this List. Copies of the report may be obtained application to the manufacturer or to Underwriters' Laboratories, This method of listing provides more complete information than be contained within the limitations of listing card space.

LABEL SERVICE

eneral—Under Label Service the manufacturer attaches labels to such is products as are found, by the specified examinations and tests con- ed by him, to be in compliance with the applicable requirements. The oratories' representatives conduct frequent inspections at the factory which the products are manufactured and labeled for the purpose of cking the efficiency of the manufacturer's own inspection program. uld the inspection by the Laboratories' representative disclose features in compliance with the requirements, the manufacturer is required to er correct such items or remove labels from the product. In many s, examinations and tests are conducted at the Laboratories on sam- of labeled products purchased on the open market and serve as a ntercheck on factory inspection work.

dentification — The Laboratories' labels bear the inspection manifest

Underwriters' Laboratories, Inc.
®
INSPECTED

ether with the Listed classification of the product involved.

ppearance of a Listee's name under a particular classification in these ts does not signify that all his products of that classification are Listed. y those devices and materials which actually bear the Label are cov- d by the Label Service.

ubscribers to the Label Service may arrange with the Laboratories the preparation of so-called combination labels, which include the pection manifest described above and the manufacturer's own name e data. All labels are obtainable from Underwriters' Laboratories, only and remain under its control until attached to the product found eptable under the service. The label of Underwriters' Laboratories, Inc. ached to this product is the only method provided by Underwriters' oratories, Inc. to identify devices and materials which have been pro- ed under its Factory Inspection and Label Service Program.

Cost — The cost of Label Service is defrayed by service charges which y according to the nature and extent of the Laboratories' inspection vities and in direct proportion to the number of labels used.

DIE-LABEL, INSPECTION AND CERTIFICATE SERVICES

General — These services are applicable to a limited number of specific oducts and are similar to Label Service except for the form of inspec- n manifest employed and the method of defraying the cost of the service.

Identification — The inspection manifest "Underwriters' Laboratories, ., Inspected," or an abbreviation thereof, stamped, cast, or molded or in the product is evidence that such product has been produced der the Die-Label Service.

Products manufactured under the Inspection Service are marked with e Listee's name or trade-mark and type designation, which correspond h the marking shown in the Laboratories' published records.

Certificates of Inspection authorized and countersigned by ins of Underwriters' Laboratories, Inc. are furnished for specific lots terial and serve as evidence that the product referred to therein ha manufactured under the Certificate Service.

Cost — The cost of the Die-Label Service and Inspection Service frayed by charges based on necessary Laboratories' inspector's ti the current hourly billing rate.

The cost of the Certificate Service is defrayed by charges for lot of material certified and vary according to the physical size and tity of the material involved.

SPECIAL SERVICES

The Laboratories will undertake the development of an appro follow-up program for a new class of product found acceptable for ing whenever one of the established forms of follow-up is not su

HOW TO USE THE LISTS RELATING TO ACCIDENT, AUTOMOTIVE, AND BURGLARY PROTECTION EQUIPMENT

Determine the classification under which you would expect the d to be listed.

Look in the Indexes on pages 128, 129, or 130 for the page numb which begins the listing of the device you are checking.

For example, if you are checking on Pressure Cookers, you will find the page number by looking under "P" for "Pressure Cookers" or under "C" for "Cookers, Pressure." Either way, you will find where those listings begin.

Right under the name (classification) of the device will usually description of what this listing covers. Read that explanation carefu find out exactly what the listing means.

For example, under "Safes and Chests," "Key-locked (Class KL)," one paragraph states: "The Class KL label is attached to the safe proper and should not be construed as applying to other safes, doors, or containers which may be anchored into the same supporting block." *That limits the listing and is important. Check all explanations thoroughly.*

Just before the first listee's name in each classification, you wil "Label Service," "Reexamination Service," etc.

For example, under the classification "Fuses, Automobile," the words "Reexamination Service" appear between the general description and the first subscriber's listing.

Where the words "Label Service" appear in the classification, th vice must bear the Label to be classed as "Listed." A picture or de tion of the Label is a part of the information given for each Label S classification.

For example, under "Ladders," appears a picture of the Label which must be on listed Ladders. Even though a listee's name appears in the List, he may not be labeling all of his output, so "Look for the Label."

If the words "Reexamination Service" appear, check the "Mar section at the end of each subscriber's listing. When the "Mar specifies a catalog number, type, model, size, or other identification n then the device *must* be marked with that designation, but whe "Marking" shows only "Listee's name" (or a trade-mark or a trade n

hen compare the catalog number, type, model, size, or other identification eans shown in the subscriber's listing with the information on the de- ice, or on the carton or package. If they agree, the device is listed.

For example, the marking may state: *"Listee's name and catalog designation."* The body of the listing shows the catalog designations listed for the subscriber, so if one of those designations and the listee's name show on the device, that device is listed. When the marking shows only *"Listee's name,"* the body of the listing will still show the listed catalog or type designations, so then the device must show the listee's name, but the catalog designation will be found on the box or carton containing the device. If the listee's name is on the device and the catalog designation on the carton is one appearing in the subscriber's listing, then that device is listed.

Watch carefully for mention in the listing of prefixes and suffixes. ometimes the basic catalog numbers may be used with prefix letters or ith suffixes so that you may have several listed devices based on one atalog number.

For example, the listing may show Type 510 with or without Type D510 (or Type W510). Likewise, Type 510D is listed and prefixes D, W, or suffixes D, W. Thus, Type 510 is listed and so is Type 510W.

PLAY-BY-PLAY EXAMPLE

Suppose you are checking a certain floor coating and finishing material o determine whether or not it is listed. The container will show the rade name and name and address of the listee. For example, "No-Fall-Glo"—All-Good Corp., Chicago, Ill.

Turn to the Index and you will find under "Floor Coating and Finishng Material" the page number on which these listings begin. Turn to hat page and you will find something like this:

FLOOR COATING AND FINISHING MATERIAL (120 L0)

Listed floor coating and finishing materials are of three classes: FTM, Floor Treatent Materials; OGA, Oil and Grease Absorbents; and WCM, Walkway Construction aterials. The materials listed have been found to have slip resistance characteristics f not less than 0.5 as determined by the Static Friction Test method of Underwriters' aboratories, Inc.

FTM, Floor Treatment Materials are (1) water-base materials; (2) fillers, sealers, arnishes, and similar materials; (3) detergents; (4) abrasive-grit-bearing liquids; 5) waxes other than water-base; (6) sweeping compounds. Floor treatment materials hich have been classified as to their fire hazard only, appear in the Gas and Oil quipment List. The following listed floor treatment materials have not been inestigated for fire hazard unless they also appear in the Gas and Oil Equipment List.

OGA, Oil and Grease Absorbents are used to absorb or adsorb oil and grease on oors. Used instead of sawdust commonly employed for this purpose, they reduce fire azard as they are noncombustible minerals which, even if saturated with oil, will ot support combustion. (See Sweeping Compounds in the Gas and Oil Equipment List.)

WCM, Walkway Construction Materials include floor plates and stair treads made f (1) natural stone, (2) composition, (3) abrasive-grit surfaced materials.

Reexamination Service

ll-Good Corp., Chicago, Ill.
"No-Fall-Glo."
Marking: Listee's name and trade name.

You are now able to identify the material as being listed, since the ntainer shows the trade name and name and address of listee as specid in the List.

886

Accident Equipment List

Numbers following classification headings are the card file guide numbers. All appearing in this section are on green cards.

This List covers those devices, materials, and systems which have been inspected for life and accident hazards and found either to be sufficiently devoid of these hazards or so to serve as safeguards to life and limb as to receive favorable consideration by the Casualty Council of Underwriters' Laboratories, Inc.

The Laboratories' Electrical Appliance and Utilization Equipment List and Electrical Construction Materials List cover materials and apparatus for electric wiring for light, heat, and power in "ordinary" locations and premises, and those for use in "hazardous" locations appear in the Hazardous Location Equipment List.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality or merit.

BELT FASTENERS AND LACERS (540 I0)

Reexamination Service

Clipper Belt Lacer Co., Grand Rapids 2, Mich.

"Clipper" fasteners of wire hook type and lacers of compression type for installing fasteners. Designed for joining ends of belting used for transmission and conveying. Fasteners made in Sizes 1 to 6 incl., and 25. Lacers made in Type Nos. 0, 1, 2, 6, 8, 9, 25, and 101.
Marking: Name and type on lacers, name and size on card of fasteners.

BELTS AND FITTINGS (WINDOW CLEANERS') (40 E0)

Reexamination Service

Harrison-Weise Co., Morton Grove, Ill.

Window anchors, Types S, ST, and 33-F; belt rope terminal, Type F.
Marking: Listee's name and type designation.

COOKERS, PRESSURE (61 O0)

Reexamination Service

Burpee Can Sealer Co., Barrington, Ill.

Models AR-25, AR-1525.
Marking: Listee's name and model designation.

Dixie Canner Co., Athens, Ga.

Nos. PCD-7, -10½, -15, -21½, -25.
Marking: Listee's name and number designation.

Kadan Co., Inc., D. A., Yonkers, N. Y.

Model 641-G.
Marking: Listee's name, trade-mark, and model designation.

Mirro Aluminum Co., Manitowoc, Wis.

Models 0392, 0394, 0396, 0398, 0406, 0416, with prefix B or M and with or without two suffix numbers.
Marking: Listee's name and model designation.

Cookers, Pressure—*Continued*

Montgomery Ward & Co., Inc., Chicago 7, Ill.

Models NP5505, -5506, -5511-A, -5512-A, -5514-C, -5519-C.
Marking: Listee's name or "Magic Seal" and model designation.

National Presto Industries, Inc., Eau Claire, Wis.

Models 7-B, 21-B, A403-A, A404-A, A603-A, A605-A, A606-A, B302-A, B403-A, B604-A, B801-B, C601-A.
Marking: Listee's name or "Presto" and model designation.

Sears, Roebuck & Co., Chicago 7, Ill.

Models 620.71, 620.161, 620.211, 620.46270, 620.46280, 620.46281, 620.46310, 620.46430, 620.46431, 620.46440, 620.46441.
Marking: Listee's name or "Maid of Honor" and model designation.

Wear-Ever Aluminum, Inc., New Kensington, Pa.

Cat. Nos. 3604-K, 3607, 3634, 3637.
Marking: Listee's name, trade name, and catalog designation.

Wisconsin Aluminum Foundry Co., Inc., Manitowoc, Wis.

All American, Model Nos. 7, 907, 910½, 921½, 925, 941½, 1915X, 1925X, 1941½X.
Marking: Listee's name, trade name, and model designation.

DISPENSERS FOR POWDER BLOWPIPES (540 I0)

Reexamination Service

Air Reduction Co., Inc., New York 17, N. Y.

Dispenser consisting of powder container operating under air pressure to deliver finely powdered iron through hose line to special cutting blowpipe. Model 50.
Marking: Listee's name and model designation.

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

Dispenser consisting of powder container operating under air pressure to deliver finely powdered iron through hose line to special cutting blow pipe, Types D-3 to -7 incl., -9.
Marking: Trade-mark "Oxweld" and type designation.

National Cylinder Gas, Div. of Chemetron Corp., Chicago 11, Ill.

Dispenser consisting of powder container and controls operating under pressure to deliver finely powdered iron through hose line to special cutting blowpipe, Models 301, 302.
Marking: Trade-mark "Ferro Jet" and model designation.

ELEVATOR APPLIANCES (102 L0)

☛ LOOK FOR THE LABEL ☚

Devices listed under this classification include Hoistway-Door Interlocks, Hoistway-Door Combination Mechanical Locks and Electric Contacts, and Hoistway-Door or Car-Door or Gate Electric Contacts, and Miscellaneous Elevator Appliances, including Hoistway Limit Switches.

The devices covered in this section are for ordinary location use only. For listing covering Elevator Appliances for use in hazardous locations, see Elevator Appliances, Guide No. 160 L0 in the Hazardous Location Equipment List.

ELEVATOR DOOR LOCKING DEVICES AND CONTACTS (102 L5)

The devices listed in this section are designed for installation and operation in accordance with the requirements of the Safety Code for Elevators, Dumbwaiters, and Escalators (ASA-A17.1-1960).

Elevator hoistway door interlocks are intended to prevent the operation of the driving machine by the normal operating device unless the hoistway door is locked in the closed position, and to prevent the opening of the hoistway door from the landing side unless the car is within the landing zone and is either stopped or being stopped.

For interlocks that do not require the use of a retiring cam, see Label A.

For interlocks that require the use of a retiring cam, see Label B. Retiring cams are not covered by these listings, and their acceptability must be determined at the point of installation by the authority having jurisdiction.

Elevator Hoistway door combination mechanical locks and electric contacts are intended to prevent operation of the driving machine by the normal operating device unless the hoistway door is in the closed position, and to lock the hoistway door in the closed position and prevent it from being opened from the landing side unless the car is within the landing zone. See Label C.

Elevator hoistway door, car door or gate electric contacts are intended to prevent operation of the driving machine by the normal operating device unless the door or gate is in the closed position. See Label D.

Elevator Appliances—Elevator Door Locking Devices and Contacts—*Continued*

The devices covered by these listings are investigated for misalignment condi... when properly installed as recommended by the manufacturer. Their acceptability ... to be determined at the point of installation by the authority having jurisdiction.

Elevator door locking devices and contacts listed under the Label Service of Un... writers' Laboratories, Inc. may be identified by a label bearing the following wordi...

(LABEL A)

Underwriters' Laboratories, Inc.
®
INSPECTED
ELEVATOR INTERLOCK
NO. _____

(LABEL B)

Underwriters' Laboratories, Inc.
®
INSPECTED
ELEVATOR INTERLOCK
RETIRING
CAM REQUIRED NO._____

(LABEL C)

Underwriters' Laboratories, Inc.
®
INSPECTED
ELEVATOR COMBINATION
MECHANICAL LOCK AND
ELECTRIC CONTACT
NO._____

(LABEL D)

Underwriters' Laboratories, Inc.
®
INSPECTED
ELEVATOR ELECTRIC CONTACT
NO._____

The label of Underwriters' Laboratories, Inc. attached to a product is evidence th... such product has been produced under the Factory Inspection and Label Servi... Program.

Label Service

Anderson & Co., C. J., A Div. of Western Industries, Inc., Chicago 10, Il...
Contacts, interlocks.

Dover Corp., Electric Elevator Div., Cincinnati 9, Ohio.
Contacts.

Elevator Supplies Co., Inc., Perth Amboy, N. J.
Interlocks.

G. A. L. Electro Mechanical Service, New York 29, N. Y.
Contacts, interlocks.

General Elevator Co., Inc., Baltimore 30, Md.
Interlocks.

Guilbert, Inc., Philadelphia 25, Pa.
Contacts, interlocks.

Harris Preble Fire Doors, Inc., Chicago 50, Ill.
Contacts, interlocks.

Haughton Elevator Co., Toledo 9, Ohio.
Interlocks.

Johnson Elevator Door Operator Co., Bronx 61, N. Y.
Interlocks.

McLauthlin Co., Geo. T., Boston 13, Mass.
Interlocks.

Elevator Appliances—Elevator Door Locking Devices and Contacts—*Continued*

Moline Accessories Corp., Moline, Ill.
Interlocks.

Montgomery Elevator Co., Moline, Ill.
Interlocks.

Otis Elevator Co., New York 1, N. Y.
Contacts, interlocks.

Pacific Elevator & Equipment Co., San Francisco 3, Calif.
Interlocks.

Payne Co., F. S., Cambridge 40, Mass.
Contacts.

Pelle Co., Inc., The, Brooklyn 37, N. Y.
Contacts, interlocks, combination locks and contacts.

Richmond Fireproof Door Co., The, Richmond, Ind.
Contacts, interlocks.

St. Louis Fire Door Co., Inc., St. Louis 15, Mo.
Contacts, interlocks.

Saberg Elevator Co., Inc., Brooklyn 32, N. Y.
Contacts, interlocks.

Security Fire Door Co., St. Louis 15, Mo.
Contacts, interlocks.

Simplex Door Co., Chicago 13, Ill.
Contacts, interlocks.

Staley Elevator Co., Inc., Long Island City 1, N. Y.
Interlocks.

Universal Elevator Door Lock Co., Los Angeles 11, Calif.
Interlocks.

Variety Fire Door Co., Chicago 12, Ill.
Interlocks.

Watson Elevator Co., Inc., New York 36, N. Y.
Contacts, interlocks.

Watson Elevator Co., Inc., Warsaw Div., New York 36, N. Y.
Contacts.

Westinghouse Electric Corp., Jersey City 4, N. J.
Contacts, interlocks.

MISCELLANEOUS (102 L90)

Devices listed in this section may be identified by a label as illustrated.

(Label A)

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Dover Corp., Electric Elevator Div., Cincinnati 9, Ohio.
Switches, hoistway limit.

Watson Elevator Co., Inc., Warsaw Div., New York 36, N. Y.
Switches, hoistway limit.

EXIT AND EXIT APPLIANCES (105 E0)

Listing of the following devices appear in this section:

Exit Locks
Fire Escapes
Panic Hardware

Assemblies listed herein have not been investigated with reference to fire resistance classifications. Related devices so classified are listed in the Building Materials List.

Rules covering proper installation and use of these devices are given in the "Building Exits Code," National Fire Protection Association Pamphlet No. 101.

EXIT LOCKS (105 E5)

The assemblies covered by this listing are intended for mounting on outward swinging doors for the purpose of locking such exit doors against unauthorized egress.

For assemblies intended to facilitate safe egress of persons in case of emergency see "Panic Hardware" listings in this list.

Assemblies listed herein have not been investigated with reference to Fire Resistance Classification. Devices so classified are listed under the classification "Hardware," Guide No. 120 ID16, in the Building Materials List.

Assemblies listed herein have not been investigated with reference to Burglary Protection Classifications. Devices so classified are listed in the Burglary Protection Equipment List.

Reexamination Service

Door Controls, Inc., New Hyde Park, L. I., N. Y.

Model 11.
Marking: Listee's name and model designation.

Exit Lock, U. S. Flare Div., Atlantic Research Corp., Saugus, Calif.

Model B.
Marking: Listee's name and model designation.

FIRE ESCAPE UNITS (105 E6)

The parts covered in this section are intended to be assembled at the construction site to form complete slide type or spiral type fire escapes.

The separate parts indicated in the individual listings are inspected at the factory by Underwriters' Laboratories, Inc. Inspection of the assembly of these parts during installation is to be made by the appropriate inspection authority in accordance with the appropriate local regulations or the Buildings Exit Code, National Fire Protection Association Pamphlet 101.

Reexamination Service

Potter Fire Escape Co., Chicago 45, Ill.

Entrances, Part Nos. 501, 601, 701, 801. Elbows, Part Nos. 502, 602. Sliding surfaces, Part Nos. 702, 802. Housing cylinders, Part Nos. 703, 803. Sections, Part Nos. 503, 603. Easements, Part Nos. 504, 604. Easement extension, Part No. 605. Swing bars, Part Nos. 505, 606, 707, 808. "Y" sections, Part Nos. 506, 607. Wall brackets, Part Nos. 507, 608. Center posts, Part Nos. 709, 804. Roof sections, Part Nos. 705, 805. Exit doors, Part Nos. 508, 609, 706, 806. Ramp, Part No. 807.
Marking: Listee's name and part designation.

PANIC HARDWARE (105 E16)

The assemblies covered by this listing are intended for mounting on or integral with outward swinging doors to facilitate the safe egress of persons in case of emergency.

Rules covering proper installation and use of doors on which this hardware is normally mounted, are given in the "Building Exits Code," National Fire Protection Association, Pamphlet No. 101.

Assemblies listed herein have not been investigated with reference to Fire Resistance Classification. Devices so classified are listed under the classification "Hardware," Guide No. 120 ID16, in the Building Materials List.

Reexamination Service

American Art Metals Co., Atlanta 12, Ga.

For use on single doors, Model PF-3.
Marking: Listee's name and model designation.

Corbin Div., P. & F., The American Hardware Corp., New Britain, Conn.

Rim type, single door, Types M, N.
Marking: Listee's trade name "Corbin" and type designation.

Detroit Hardware Mfg. Co., Roseville, Mich.

For use on single doors, Model Nos. 7-100, -101, -200, -201, -202, -300.
Marking: Listee's name and model designation.

Exit and Exit Appliances—Panic Hardware—*Continued*

Jackson Exit Device Corp., Los Angeles 23, Calif.

For use on single doors, Model 880H.
Marking: Listee's name and model designation.

Lincoln Hardware Mfg. Co., St. Clair Shores, Mich.

Rim type, single door, Type 69.
Marking: Listee's name and type designation.

Lockwood Hardware Mfg. Co., Fitchburg, Mass.

For use on single or double doors, Models 90B, 93B.
Marking: Listee's name and model designation.

Reed, Inc., Roland D., Rensselaer, Ind.

Model NL-9 for use on single or double doors not exceeding 42 in. width.
Marking: Listee's name and model designation.

Richards-Wilcox Mfg. Co., Aurora, Ill.

For use on single or double doors, Cat. Nos.* 144, 144-1, 144-2, 244, 244-1, 244-2.
*May be provided with outside handle, latch or lock operating independently of the trip bar.
Marking: Listee's name and catalog designation.

Russell & Erwin Div., The American Hardware Corp., New Britain, Conn.

Rim type, single door, Types M, N.
Marking: Listee's trade name "Russwin" and type designation.

Sargent & Co., New Haven 9, Conn.

Mortise lock, single or double doors, Types 12-59(†), -99(†), 56, 59(†), 99. Rim-type, single or double doors, Types 55, 58, 98. Vertical rod, surface mounted, single or double doors, Types 12-57, -97, 54, 57, 97.
†With No. 99-2 mortise case.
Marking: Listee's name and number designation.

Sargent & Greenleaf, Inc., Rochester 21, N. Y.

Rim type, single door, Models* SG-5300, -5311, -5322, -5333, -5344, -5355.
Vertical rod, surface mounted, single or double doors, Models* SG-5400, -5410, -5422, -5433, -5455, -5600, -5610, -5622, -5633, -5644, -5655.
The above numbers may be prefixed with letters "KD".
The suffix letter "T" will be used only on Models 5400, 5422, 5433, 5455, 5600, 5622, 5633, 5644, 5655.
*May be provided with outside handle, latch, or lock operating independently of the trip bar.
Marking: Listee's name and model designation.

Steffens-Amberg Co., The, Newark, N. J.

For use on single or double doors: rim locks, Cat. Nos. 54, X54, AH254, AK254, H254, K254; mortise locks, Cat. Nos. 31, 34, 35, 36, A36, 37, 81; assemblies, Cat. Nos. 25, 45, 100, 131, 134, 135, 136, A136, 137, 300, 331, 334, 335, 336, A336, 337, 500, 531, A536, 537, 580, 581, 800, A836, 837, 880, 881.
Marking: Listee's name or "Smith" and catalog designation.

Vonnegut Hardware Co., Indianapolis 25, Ind.

Mortise lock, single door, Types B2, C2, S, U, VA, X, Y. Rim type, single door, Types A, A2, 66, 88. Vertical rod, concealed, single or double doors, Types NC, S. Vertical rod, surface mounted, single or double doors, Types B2, C2, U, VA, X, Y.
Surface applied vertical rod type consisting of Type 88 center case assembly with top and bottom latch bolts, Type 20VR.
Marking: Listee's name and type designation.

Yale & Towne Mfg. Co., White Plains, N. Y.

Panic hardware comprising center or top and bottom latching bolts operated by panic bar. For use with single or double doors swinging outward. Types 5A and 5R. Models 10A, 10R.
Marking: Listee's name or trade name and type or model designation.
Mortise type panic hardware consisting of active slide case, inactive hinge case, cross bar assembly and mortise lock for use on outward swinging single or double doors, or on active door of doors on pairs, Type 30.
Marking: Listee's name and "30" cast into active case, and "30" stamped on exposed face plate of lock.

FLOOR COATING AND FINISHING MATERIAL (120 L0)

Floor coating and finishing materials are of three classes: FTM, Floor Treatment Materials; OGA, Oil and Grease Absorbents; and WCM, Walkway Construction

Floor Coating and Finishing Material—*Continued*

Materials. The materials listed have been found to have slip resistance characteristics of not less than 0.5 as determined by the Static Friction Test Method of Underwriters' Laboratories, Inc.

FTM, Floor Treatment Materials are (1) water-base materials; (2) fillers, sealers, varnishes, and similar materials; (3) detergents; (4) abrasive-grit-bearing liquids; (5) waxes other than water-base; (6) sweeping compounds. Floor treatment materials which have been classified as to their fire hazard only, appear in the Gas and Oil Equipment List. The following listed floor treatment materials have not been investigated for fire hazard unless they also appear in the Gas and Oil Equipment List.

OGA, Oil and Grease Absorbents are used to absorb or adsorb oil and grease on floors. Used instead of sawdust commonly employed for this purpose, they reduce fire hazard as they are noncombustible minerals, which, even if saturated with oil, will not support combustion. (See Sweeping Compounds in the Gas and Oil Equipment List.)

WCM, Walkway Construction Materials include floor plates and stair treads made of (1) natural stone, (2) composition, (3) abrasive-grit surfaced materials.

Reexamination Service

A & R Sales Co., Inc., Bronx 57, N. Y.

Type FTM-5: Arco Special Prepared Paste Wax.
Marking: Listee's name and trade name.

Abbott Supply Co., Detroit 6, Mich.

Type FTM-1: #390 Saif Wax, #395 Saif Wax, #400 Abbott Floor Sav'r Wax, #425 Abco Wax, #445.
Marking: Listee's name and trade name.

Abco, Inc., McKeesport, Pa.

Type FTM-1: Buff Glaze, Plasti-Glaze, Utili-Glaze, Glaze Waxless Floorfinish, #3 Floor Film. Type FTM-6: Dustroy.
Marking: Listee's name and trade name.

Aborn Chemical Industries, Providence 3, R. I.

Type FTM-1: No. 151 Ark No-Rubbing Wax.
Marking: Listee's name and trade name.

Absorb-It-Compound Corp., Joliet, Ill.

Type OGA: Absorb-It.
Marking: Listee's name and trade name.

Accommodation Sanitary Supply Co., Philadelphia 6, Pa.

"Sanco Self-polishing Wax," "Sanco Safe-Tred Wax" (FTM-1).
Marking: Listee's name and trade name.

Acme Chemical Co., Milwaukee 45, Wis.

Type FTM-1: *Super Florgard, Florgard,* Saber. Type FTM-2: Misto.
Marking: Listee's name and trade name.

Acme Maintenance & Supply Co., Inc., Fitchburg, Mass.

Type FTM-1: Acme's Floor Wax.
Marking: Listee's name and trade name.

Acme Sanitary Supply Co., Denver 5, Colo.

Type FTM-1: Acmegloss, Acme Gloss N-S, Acme Gloss WR.
Marking: Listee's name and trade name.

Adco, Inc., Sedalia, Mo.

Type FTM-1: Magic Gloss.
Marking: Listee's name and trade name.

Alabama Sanitary Supply Co., Gadsden, Ala.

"Alasco Floor Wax," "Alasco Floor Wax-Heavy Duty," "Phillip's '99' Heavy Duty Floor Wax," "Phillip's '99' Floor Wax" (FTM-1); "Phillip's '99' Gym Finish," "Phillip's '99' Penetrating Seal" (FTM-2).
Marking: Listee's name and trade name.

Aladdin, Inc., Atlanta, Ga.

"Magi-Gloss Wax" (FTM-1).
Marking: Listee's name and trade name.

Albright Co., Baltimore 15, Md.

Type FTM-1: Albright Tilax, Albright 3-F Floor Coating, Albright Symplax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Allen Chemical Co., Miami 42, Fla.

Type FTM-1: Alco Lustre, Alco Perma Gloss Wax, Perma-Cote, Alco Safety-Gloss Self Polishing Wax.
Marking: Listee's name and trade name.

Allied Continental Corp., Chicago 5, Ill.

Type FTM-1: Allied Self-Polishing Wax, Allied Safety Self-Polishing Wax.
Marking: Listee's name and trade name.

Allied Home Products Corp., Beloit, Wis.

"C-Z Self-Polishing Wax," "C-Z Super Wax," "C-Z Anti-Slip Water Resistant Self-Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Amador Chemical Corp., Stockton 5, Calif.

Type FTM-1: Amador Emulsion Floor Finish J-HD, Amadax Reflection. Type FTM-5: Amador High Polish Paste Wax.
Marking: Listee's name and trade name.

American Biltrite Rubber Co., Trenton 2, N. J.

Type FTM-3: Amtico Floor Cleaner.
Marking: Listee's name and trade name.

American Brush Co., Portland 14, Ore.

"Abco" (FTM-1).
Marking: Listee's name and trade name.

American Building Maintenance Co., Detroit 12, Mich.

Type FTM-1: American Building Maintenance Floor Finish.
Marking: Listee's name and trade name.

American Chemical Co. of Louisiana, Inc., Metairie, La.

Type FTM-1: Super Wax, Amcote Finish, Non Skid Wax, Terrazzo Wax, Amco Polycote. Type FTM-3: Amco Golden Concentrate.
Marking: Listee's name and trade name.

American Dryco Co., Allston, Mass.

Type FTM-1: Dryco Anti-Skid Floor Wax.
Marking: Listee's name and trade name.

American Floor Machine Co., Div. of American-Lincoln Corp., Toledo 3, Ohio.

Type FTM-1: Lustre Finish, No Rub Wax, American Asphalt Tile Finish. Type FTM-2: American Floor Cleaner, American Terrazzo Sealer, American Terrazzo Finish, American Fast-Drying Economy Seal, American Floor Varnish, Economy Seal, Fast Drying Floor Seal, Lustre-Var Seal and Finish, Penetra-Seal.
Marking: Listee's name and trade name.

American Oil Co., Chicago 80, Ill.

Type FTM-1: Amoco Liquid Wax.
Marking: Listee's name and trade name.

American Sanitary Products Co., Denver 5, Colo.

Type FTM-1: *Burkam Magic Wax, Burkam Magic Heavy Duty Wax, Burkam Magic Heavy Duty Special Anti-Slip, Burkam Magic Special Anti-Slip Liquid Wax*, No. BM-16 Self-Polishing Liquid Wax with Ludox.
Marking: Listee's name and trade name.

American Wax Co., College Point, N. Y.

Type FTM-1: 396-13, American Self Polishing Liquid Wax.
Marking: Listee's name and trade name.

Andrako Inc., Pittsburgh 37, Pa.

Type FTM-1: Andrako Supreme Floor Finish. Type FTM-3: Andrako Liquid Detergent, Andrako Wax Remover and Cleaner.
Marking: Listee's name and trade name.

Apex Chemical Co., Apex, N. C.

Type FTM-1: Apex Heavy-Duty Wax, Apex Self-Polishing Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Armstrong Cork Co., Lancaster, Pa.

Type FTM-1: Armstrong Heavy Duty Commercial Floor Wax.
Marking: Listee's name and trade name.

Armstrong Paint & Varnish Works, Inc., Chicago 23, Ill.

Type FTM-1: Styrenated Acrylic Floor Finish 14%-16.5%.
Marking: Listee's name and trade name.

Arnold's Supply Co., Rochester, Minn.

Type FTM-1: Flor-Gleem.
Marking: Listee's name and trade name.

Asbestolith Mfg. Corp., Brooklyn 22, N. Y.

"Asbestolith Neutral Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Aspden Associates, Inc., Greensboro, N. C.

Type FTM-1: Combo, Doubleaye Wax Undercoater, Doubleaye Super-Lustre V.R.D. Doubleaye Brand No Rubbing Floor Wax, Doubleaye Brand Tred Sure, Per-Ma-Shi No. 1213 Heavy Duty Wax, Doubleaye Brand Sparkle Wax, Doubleaye Brand Asp Tile Finish, No. 1819 Heavy Duty Wax, CS-1213 No Slip Floor Wax, 050 Tile Floor Fini Tile Floor Finish No. 141, Heavy Duty Wax No. 189.
Marking: Listee's name and trade name.

Associated Cleaning Contractors, Inc., Atlanta, Ga.

"Associated Cleaning Contractors, Inc. Heavy Duty Wax Special Anti-Slip," "Associa Cleaning Contractors, Inc. Heavy Duty Wax," "Associated Cleaning Contractors, In Wax" (FTM-1).
Marking: Listee's name and trade name.

Associated Just Distributors, Baltimore 31, Md.

Type FTM-1: Just Flexible Film Floor Finish, Just Self Polishing Liquid Wax. Ty **FTM-3:** Just Cleaner-Disinfectant.
Marking: Listee's name and trade name.

Astor Supply Co., Inc., New York 13, N. Y.

Type FTM-1: Floor Seal and Finish, Buffable Floor Finish. **Type FTM-3:** Formula 4 All Purpose Cleaner, Formula 214 All Purpose Cleaner.
Marking: Listee's name and trade name.

Atlantic Chemical & Equipment Co., Atlanta 18, Ga.

Type FTM-5: Polyethylene Base Plastic Self Polishing Floor Finish #300, Polyethyle Based Self-Polishing Floor Wax #500X.
Marking: Listee's name and trade name.

Auerbach Chemical Company, Inc., Philadelphia 34, Pa.

Type FTM-1: Acemco RF-54 Tuff-Tred, Acemco WX-12, Acemco WX-15, Acemco WX-3 Tran-Safe, Acemco Product TS-56. **Type FTM-3:** Acemco FS-53 Flash, Acemco WC-1
Marking: Listee's name and trade name.

Azee Soap Co., Inc., Brooklyn 1, N. Y.

"Azee Self Polishing Heavy Duty Wax" (FTM-1).
Marking: Listee's name and trade name.

B-B Paint Corp., Flint, Mich.

Type FTM-1: Hi Shine Wax.
Marking: Listee's name and trade name.

B & W Chemical Co., Harbor City, Calif.

Type FTM-1: Lustre Cote Self Polishing Floor Wax, Stan Cote, Safe Cote Self Polis ing Floor Wax, Bid Wax, Poly Cote Self-Polishing Floor Wax, No. 1 Self Polishi Floor Wax, Poly Cote Self Polishing Floor Finish, Tuf Cote Self Polishing Floor Wa
Marking: Listee's name and trade name.

Baird & McGuire, Inc., Holbrook, Mass.

Type FTM-1: Micarn Floor Wax.
Marking: Listee's name and trade name.

Ball Chemical Co., Cleveland 11, Ohio.

Type FTM-1: Conversation Waxless Finish.
Marking: Listee's name and trade name.

Ball Co., A. W., Los Angeles 26, Calif.

Type FTM-1: Commercial Floor Wax, Slo Ball, Ball Polymer Floor Finish.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Bancroft Paper Co., Inc., The, Shreveport, La.

Type FTM-1: Bancroft High Lustre, Bancroft Economy, High Luster Heavy Duty Wax, Safe Luster Heavy Duty Wax, Hard Luster Heavy Duty Wax, Poly Luster Floor Finish, Safe Luster Heavy Duty Self-Polishing Wax, High Luster Self-Polishing Wax.
Marking: Listee's name and trade name.

Banner Chemical Products Co., Newark 5, N. J.

Type FTM-1: Banner Water Emulsion Paste Wax.
Marking: Listee's name and trade name.

Barco Supply Co., Medford, Ore.

Type FTM-1: Barco Flor-Glo.
Marking: Listee's name and trade name.

Bares Co., The, Cleveland 20, Ohio.

Type OGA: Soakup.
Marking: Listee's name and trade name.

Bay-Ran Janitor Supply Co., Washington 10, D. C.

Type FTM-1: Bay-Ran Imperial Floor Finish, Bay-Ran Imperial Floor Dressing.
Marking: Listee's name and trade name.

Bell Chemical Co., Dallas 7, Texas.

Type FTM-1: Belco Bell-Cote Plastic Floor Finish, Belco Super Wax, Belco High-Shine Super Wax. Type FTM-3: Belco B&B, A Super Concentrated Cleaner.
Marking: Listee's name and trade name.

Bernhardt Bros., Inc., Brooklyn 2, N. Y.

Type FTM-1: Fenelene O Anti-Skid Floor Finish, Waxcote Heavy Duty Floor Wax.
Marking: Listee's name and trade name.

Bestall Chemical Co., New York 10, N. Y.

Type FTM-1: Safe-Tee Shine Formula #11, Safe-Tee Glo Formula #15, Safe-Tee Brite Formula #21.
Marking: Listee's name and trade name.

Best Maintenance Supply Co., Los Angeles 21, Calif.

Type FTM-1: Best No-Rub Floor Finish, Best Dur-O-Shine, Best Formula 660, Last, Best Hospital Wax 125, Best Hospital Wax 185, Best Supreme Wax 125, Best Supreme Wax 185, Super Saf-T-Kote 125, Super Saf-T-Kote 185, Heavy Duty Saf-T-Glo, Duro-shine, Modern Wax, Floor Ever. Type FTM-3: Skrub-All, Formula 1603, Thoro-Kleen. Type OGA: Besorbant.
Marking: Listee's name and trade name.

Biscayne Chemical Laboratories, Inc., Miami 32, Fla.

Type FTM-1: Dura-Tread, BCL Floor Finish.
Marking: Listee's name and trade name.

Bixon Chemical Corp., New York 59, N. Y.

Type FTM-1: No. 13 Self-Polishing Floor Wax, No. 800 Perfect Non-Scuff Floor Finish, Superior Floor Wax No. 821, Superior Floor Wax, No. 823, Kleen-N-Polish Water Emulsion Paste Wax, #805 Acrilyn Floor Finish.
Marking: Listee's name and trade name.

Blue Wonder Co., New York 10, N. Y.

"Blue Wonder DeLuxe Wax," "Blue Wonder Wax (LU)" (FTM-1); "Blue Wonder Liquid Lustre" (FTM-3).
Marking: Listee's name and trade name.

Bockstanz Bros. Co., Detroit 7, Mich.

Type FTM-1: B-Brite Wax, Plecsall Wax, Insurance Gloss, Saf-T-Step Wax. Type FTM-2: Tuf-Seal, Asphalt Tile Finish, BB Terrazzo Seal, BB Terrazzo Finish, Pentra Seal, Rino Seal.
Marking: Listee's name and trade name.

Bon Ami Co., Inc., The, New York 22, N. Y.

Type FTM-1: Bon Ami Radiant Liquid Finish, Bon Ami Heavy Duty Liquid Wax, Bon Ami Durable Liquid Wax, Type FTM-3: Bon Ami Wax Stripper.
Marking: Listee's name and trade name.

Bond Laboratories, Inc., Newark 5, N. J.

Type FTM-1: Bon-Gleam Emulsion Paste Wax, Bon-Tuff Heavy-Duty Protective Floor Finish, Bon-Gleam Liquid Floor Wax, Traction-X Liquid Floor Finish.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Bond Sanitary Products Co., York, Pa.

Type FTM-3: Bond Just.
Marking: Listee's name and trade name.

Bonnie Brite Products Corp., New Hyde Park, N. Y.

Type FTM-1: Bonnie Brite. **Type FTM-5:** Bonnie Brite Paste Wax, Bonnie Brite Cleaning Wax.
Marking: Listee's name and trade name.

Boyle-Midway Inc., New York 16, N. Y.

Type FTM-1: Institutional Dri-Brite Floor Wax, Old English Dri-Brite Brand Self-Polishing Wax, Old English Self-Polishing Dri-Brite, Aerowax No Rubbing Floor Wax, Institutional Dri-Brite Slip-Resistant Floor Wax Ludox, Institutional Aerowax No Rubbing Floor Wax.
Marking: Listee's name and trade name.

Brady Co., Thomas J., Drexel Hill, Pa.

Type FTM-1: Bra-Co "Three" Disinfectant.
Marking: Listee's name and trade name.

Bridwell Co., John B., Evanston, Ill.

Type FTM-1: John B. Bridwell's Mirror-Steel Professional Floor Wax, John B. Bridwell's Mirror-Steel Professional Non Wax Finish.
Marking: Listee's name and trade name.

Bruce Co., E. L., Memphis 1, Tenn.

Type FTM-1: Bruce Self-Polishing Wax, Asphalt Tile Wax, Clansman, Tartan, Bruce Copolymer No. 19. **Type FTM-2:** Floor Seal, Gym Finish, Speed-Seal, Bruce Floor Varnish. **Type FTM-3:** Floor Cleaner, Cleaning Wax, Asphalt Tile Cleaner, Red Plaid Liquid Cleaner-Disinfectant, Bruce 5 Minute Wax Remover, Wax Remover Concentrate. **Type FTM-5:** Tuf-Lustre Wax, Paste Wax, Bruce Liquid Paste Wax. **Type FTM-4:** Bruce Dust Kleen.
Marking: Listee's name and trade name.

Brulin & Co., Inc., Indianapolis 7, Ind.

Type FTM-1: Bakespar, Brulincoat, Brulin Bright, Chain-Bright, Chain-Coat, Floor Gloss, Friendly House Waxless Floor Finish, Radiant Gloss, Brulin Tread, Super Wax, Kleen-Sheen, Duracryl. "Bakespar Formula 31." **Type FTM-2:** Poro-Seal, Cement Seal Coat, #796 Penetrating and Burnishing Seal, Floor Prep, *Hour Seal, Mastic Sealer, Deep-kote, Terrazzo Seal,* Wood Floor Conditioner.
Marking: Listee's name and trade name.

Buckingham Wax Co., Inc., Long Island City 1, N. Y.

Type FTM-1: No Rubbing Liquid Floor Wax, No Rubbing Liquid Floor Wax No. 10, Self Polishing Liquid Floor Wax with DuPont Ludox, Flexi-Cote Floor Finish, Wax Emulsion Paste Wax. **Type FTM-3:** Nutra-Sheen, Buckingham Wax-Base Cleaner, Concentrated Synthetic Floor Cleaner.
Marking: Listee's name and trade name.

Building Chemicals Corp., New York 17, N. Y.

Type FTM-2: B.C.C. Krylseal Emulsion.
Marking: Listee's name and trade name.

Building Maintenance Supplies Co., New York 11, N. Y.

Type FTM-1: Bu-Mas-Co Durable Floor Finish.
Marking: Listee's name and trade name.

Bullen Chemical Co., Inc., The, Folcroft, Pa.

"BMC Floor Maintainer No. 2," "BMC Floor Maintainer No. 2 Special," "Bullen's Super Safety Wax, Heavy Duty," "Bullen's Slip-Resistant Wax," "Bullen's Super Safety Wax," "Bullen's N/S Floor Coat" (FTM-1).
Marking: Listee's name and trade name.

Butcher Polish Co., The, Malden 48, Mass.

Type FTM-1: Commerce Brand, Green Stripe Waterproof, Butcher's Waterproof Super-Slo, Show Room, Butcher's Thrifti-Step Slip Resistant Floor Wax, Butcher's One-Step Slip-Resistant Water Emulsion Cleaning Wax, White Crown. **Type FTM-3:** Butcher's Detergent Cleaner, Butcher's Heavy Duty Detergent Stripper and Cleaner, Butcher's Germicide Cleaner.
Marking: Listee's name and trade name.

C.M.C. Laboratories Co., New York 12, N. Y.

Type FTM-1: C.M.C. Liquid Wax, C.M.C. Non-Skid Liquid Wax, C.M.C. No. 23 Liquid Floor Wax, *CMC Hi-Glo Floor Finish.*
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Candy & Co., Inc., Chicago 32, Ill.

Type FTM-1: Bright Beauty 12%-18% incl., Candy's #1012, Candy's #1016, Candy's No. 1012-B, Candy's No. 1016-B, Candy's Deluxe 12%, Candy's Supreme 12%-18% incl., Candy's Supreme Special AS-12%, Candy's Supreme Special WR-12% to -18% incl., Cand-Dox No. CS-12% to -18% incl., Super Cand-Dox 12%-18% incl., Candi-Coat #1000-12% to -18% incl., Candi-Wax #6000-12% to -18% incl., Candi-Coat-2600 12%-18% incl., Candi-Coat No. 8000 12%-18% incl., Candy's #5000 Super WR-12% to -18% incl. Type FTM-3: Bright Beauty 11/12%, Bright Beauty 15/16%, Candi-Clean 10/11%, Candi-Clean 13/14%.
Marking: Listee's name and trade name.

Canfield Oil Co., The, Cleveland 4, Ohio.

Type OGA: Canfield Oil Spunj, Canfield 00 Oil-Spunj, Dri-So Absorbent.
Marking: Listee's name and trade name.

Cardinal Chemasan Co., St. Louis 18, Mo.

Type FTM-1: Trophy, Gloss A, Econo Shine Wax, Wearever Water Resin Emulsion.
Marking: Listee's name and trade name.

Carley, Gordon C., Rome, N. Y.

Excel No Rubbing Floor Wax," "Excel Super No Rubbing Floor Wax," "Excel Special Anti-Slip No Rubbing Floor Wax," "Excel Super Special Anti-Slip No Rubbing Floor Wax" (FTM-1); "Excel Penetrating Seal," "Excel Gym Finish" (FTM-2); "Excel Floor Cleaner," "Excel Odorless Floor Cleaner," "Excel Ammoniated Wax Remover," "Excel Liquid Detergent" (FTM-3).
Marking: Listee's name and trade name.

Carpenter Co., C. S., Washington 8, D. C.

Carpway 47" (OGA).
Marking: Listee's name and trade name.

Cato Chemical Co., Elmhurst, Ill.

Type FTM-1: Catowax, Safety Plate, Slip-Stop.
Marking: Listee's name and trade name.

Cello Chemical Co., The, Baltimore 2, Md.

Type FTM-1: Industrial Wax No. 14, Industrial Wax No. 16, Industrial Wax No. 18, Industrial Wax No. 20, De-Luxe No-Buff Wax, Pantaloon, Pantaloon Mixture No. 14, Pantaloon Special Formula, Cellothane, Corridor Wax, Heavy Duty Wax, Contractor's Wax. Type FTM-5: High-Gloss Mineral Spirits Paste Wax, Cello Wax.
Marking: Listee's name and trade name.

Center Chemical Co., Atlanta, Ga.

Type FTM-1: Cento-Wax, Cento-Glo, Cento-Gloss, Cento Saf-T-Glo, Cento Saf-T-Gloss, Cento F-700. Type FTM-3: Cento-Brite, Cento 411.
Marking: Listee's name and trade name.

Central Chemical Co., Dallas 1, Texas.

"Nu Brite" (FTM-1).
Marking: Listee's name and trade name.

Central Chemical Co., Inc., Kansas City 15, Kan.

Type FTM-1: Central's F-125 Self-Glossing Wax, Cen-Glow Water Resistant Self-Glossing Wax, Nu Shine.
Marking: Listee's name and trade name.

Central Wax & Chemical Co., Stockton 4, Calif.

Type FTM-1: Central Supreme Emulsion Floor Finish.
Marking: Listee's name and trade name.

Cresit Waterproofing Corp., Chicago 16, Ill.

Type FTM-2: Colocure, Cerco Penetrating Sealer.
Marking: Listee's name and trade name.

Cervetto Co., Joe, San Francisco, Calif.

"Coat of Arms Wax" (FTM-1); "Coat of Arms Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Chemex Industries, Inc., Tampa, Fla.

Type FTM-1: Skip Insecticidal Wax #772. Type FTM-3: Skip Germicidal Cleaner. Type OGA: *Quick-Dri.*
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Chemical Concentrates, A Div. of Baker Industries, Inc., Fort Washington, Pa.

Type FTM-1: Veneer-O-Wax, Veneer-O-Gloss.
Marking: Listee's name and trade name.

Chemical Corp. of America, Tallahassee, Fla.

Type FTM-1: Freewax, Freeseal.
Marking: Listee's name and trade name.

Chemical Products Co., Omaha 10, Neb.

Type FTM-1: Kleenmaster Heavy Duty Liquid Wax, Kleenmaster 18 Heavy Duty Liquid Wax.
Marking: Listee's name and trade name.

Chemical Sales Corp., Buffalo 13, N. Y.

Type OGA: Floridex.
Marking: Listee's name and trade name.

Chemical Service of Baltimore Inc., Baltimore 30, Md.

Type FTM-1: Safe-T-Sheen, Lab Self-Lustre Wax, Cetox, Lab 99, Lab 100, Lab 125, Lab Super 15, Lab Super 16, Lab Super 18, Lab Super 22, Super Safe 101 Hydraoxated Carnauba Floor Wax, Hard Surface 202 Hydraoxated Carnauba Safety Wax, Hydrowax-L Liquid Wax, Lab Cote, Total System Acrylic Maintenance Compound. **Type FTM-4:** Alkatrol, Vinyl Maintainer. **Type FTM-5:** Lab Super Waterproof Cream Wax.
Marking: Listee's name and trade name.

Chicago Cleaning Contractors Corp., New York 18, N. Y.

Type FTM-1: Chicago Floor-Wax.
Marking: Listee's name and trade name.

Chicago Sanitary Products Co., Chicago 8, Ill.

Type FTM-1: Safety Gloss Wax, So-Brite, Wear-Brite. **Type FTM-2:** Nu-Brite.
Marking: Listee's name and trade name.

Churchill Co., Inc., The, Galesburg, Ill.

Type FTM-1: Aladdin Self-Polishing Wax, *Traz-Sheen, Vinyl-Sheen.*
Marking: Listee's name and trade name.

Clan Mfg. Co., Camden 2, N. J.

Type FTM-1: Clan Heavy Duty No Rubbing Wax #1400.
Marking: Listee's name and trade name.

Clarkson Chemical Co., Inc., Williamsport, Pa.

Type FTM-1: Saf-T-Sheen.
Marking: Listee's name and trade name.

Cleaning Materials Co., New York 33, N. Y.

Type FTM-1: Cleaning Materials Self Polishing Floor Wax.
Marking: Listee's name and trade name.

Clean-It, Inc., Endwell, N. Y.

Type FTM-1: Clean-It, Inc. Heavy Duty Anti-Slip Wax, Clean-It, Inc. Heavy Duty Wax, Clean-It, Inc. Wax, Clean-It, Inc. Anti-Slip Wax, Clean-It, Inc. Sam-Kote. **Type FTM-3:** Clean-It, Inc. Heavy Duty Cleaner.
Marking: Listee's name and trade name.

Clifton Sales Co., The, Lakewood 7, Ohio.

Type FTM-1: Heavy Duty Wax, Safe Walk Wax.
Marking: Listee's name and trade name.

Coast Wide Supply Co., Seattle 1, Wash.

"CoWy 12," "CoWy 14," "CoWy 18" (FTM-1).
Marking: Listee's name and trade name.

Colgate-Palmolive Co., New York, N. Y.

Type FTM-3: Liquid Ben Hur.
Marking: Listee's name and trade name.

Colonial Refining & Chemical Co., Cleveland 16, Ohio.

Type FTM-1: Super Glazoleum.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Color Tile Co., Joliet, Ill.

Type FTM-3: Color Tile Floor Cleaner.
Marking: Listee's name and trade name.

Colt-Worthington Oil Works, Inc., Westbury, L. I., N. Y.

Type OGA: Argo-Dri Absorbent.
Marking: Listee's name and trade name.

Columbia Laboratories, Inc., Chicago 5, Ill.

"Columbia H.Q. Wax 99.8% Pure" (FTM-1); "Columbia H.Q. Penetrating Seal," "Columbia H.Q. Super Gym Seal" (FTM-2).
Marking: Listee's name and trade name.

Columbia Wax Co., Glendale 4, Calif.

Type FTM-1: Columbia AA Plus Floor Wax, Columbia M Floor Wax, Columbia R Floor Wax, Columbia Snug Floor Wax, Columbia A Plus Floor Wax, Columbia MM Floor Wax, Columbia RR Floor Wax, Columbia Safeguard Floor Finish, Columbia Polyin Floor Polish, Columbia Self-Polishing Floor Wax, Columbia Super Pol Floor Polish, Columbia Star Floor Finish. **Type FTM-2:** Columbia Terra-Cee Sealer, Colco Penetrating Floor Seal, Colco Gymn-Finish Floor Seal. **Type FTM-3:** Marbleous Floor Lotion, Colco Multi-Use Cleaner, Columbia Stripper Floor Cleaner, Cleanicide, Columbia Spring Day Germicidal Cleaner, Columbia Hetra Cide, Columbia Hetra Col, Columbia Hetra Phyl, Columbia Hetra Dex. **Type FTM-5:** Columbia Solpreme Floor Wax.
Marking: Listee's name and trade name.

Conco Chemical Co., Dallas, Texas.

Type FTM-1: Con-O-Shine, Con-O-Shine 18, Glimmer, Glitter, Glitter 18, Stop-Slip.
Marking: Listee's name and trade name.

Concord Chemical Co., Inc., Camden 1, N. J.

Type FTM-1: Concord Shene 12% Solids, Concord Shene 16% Solids, Nurez, Superez, Custom Wax 12%, Custom Wax 16%.
Marking: Listee's name and trade name.

Conley Chemical & Supply Co., Spokane 10, Wash.

Type FTM-1: Crystalite Special Asphalt Tile Floor Wax, Crystalite Special Rubber Tile Floor Wax, Para-Gloss, Safe-Tee Tread, Con-O-Gloss Gold Label Super Wax, Tuff-16, *Mirro-Lite, Carna Gloss Self-Polishing Wax.*
Marking: Listee's name and trade name.

Consumers Supply Co., Detroit 26, Mich.

Type FTM-1: Consumers DeLuxe Flo Glo Extra Heavy Duty Self Polishing Wax No. 1118.
Marking: Listee's name and trade name.

Continental Chemical Co., The, Cleveland 4, Ohio.

"Carnowax" (FTM-1); "Endurex Finish," "Endurall Heavy Duty Seal and Finish," "Mal seal," "Continental Terrazzo Seal" (FTM-2); "Klenosan" (FTM-3).
Marking: Listee's name and trade name.

Continental Wax Corp., Mount Vernon, N. Y.

Type FTM-1: Car-Na-Lac, Continental 18, Grip Kote, Continental Six Month Floor Wax.
Marking: Listee's name and trade name.

Cooperative School Purchasers, Inc., Cazenovia, N. Y.

"Co-San" (FTM-1).
Marking: Listee's name and trade name.

Correlated Products, Inc., Indianapolis 25, Ind.

Type FTM-1: Waterproof Wax.
Marking: Listee's name and trade name.

Cortes-Ward Co., Inc., New York 13, N. Y.

Type FTM-1: Dries Bright.
Marking: Listee's name and trade name.

Costello Mfg. Co., St. Louis 1, Mo.

Type FTM-1: Moisture-Proof Wax, Hi-Glow Wax, Emulso Wax, Safe Tred Wax, Centennial Wax, Floor Coat.
Marking: Listee's name and trade name.

Craver-Hicks Co., Midland, Texas.

Type FTM-1: Slip Resistant Palico Self-Polishing Wax, No. 14 Palico Self-Polishing Wax, Palico Self-Polishing Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Crawford Industries, Inc., Oil City, Pa.

Type FTM-3: Just.
Marking: Listee's name and trade name.

Creco Co., Inc., Long Island City 1, N. Y.

Type FTM-1: Sure Grip Non-Rubbing Wax.
Marking: Listee's name and trade name.

Crown Laboratories & Supply Co., San Francisco 3, Calif.

Type FTM-1: Evershine, Evershine Scholastic, Diploma.
Marking: Listee's name and trade name.

Crown Supply, Inc., Arlington 2, Va.

Type FTM-1: Crown Cote Plastic Finish Wax, Crownshine Liquid Self-Polishing Wax, Crownbrite Safety Surface Floor Dressing, Crownshine Liquid Floor Wax, Crown Liquid Floor Wax. **Type FTM-3:** Surfashine Liquid Floor Cleaner.
Marking: Listee's name and trade name.

Crystal Chemical Co., New York 35, N. Y.

Type FTM-1: Velvet Floor Finish.
Marking: Listee's name and trade name.

Custom Laboratories, Inc., Spokane 1, Wash.

Type FTM-1: Safe-Lox Super Film Wax, Challenger Industrial Wax, Triple-Tred Extra Service Wax, C-Brite Industrial Floor Wax, Poly-Rez Floor Finish.
Marking: Listee's name and trade name.

Dalco Corp., Minneapolis 4, Minn.

Type FTM-1: Super Dal-Cote. **Type FTM-2:** 10 Liquid Paste Wax, 20 Penetrating Seal, 30 Asphalt Tile Renewer, 40 Terrazzo Sealer.
Marking: Listee's name and trade name.

Dameron Enterprises, Inc., Louisville 3, Ky.

Type FTM-1: Vi-Lan Floor Finish. **Type FTM-3:** Vi-Lan Bact-Clean.
Marking: Listee's name and trade name.

Danbury Chemical Co., Danbury, Conn.

Type FTM-1: Formula 100 Floor Finish.
Marking: Listee's name and trade name.

Davies-Young Soap Co., The, Dayton 1, Ohio.

Type FTM-1: Beamax, Aquowax, Tred-Safe, Cirene, G-784 and Dy-Glo.
Marking: Listee's name and trade name.

Davis Mfg. Co., Inc., San Antonio 7, Texas.

Type FTM-1: Dav-O-Shine Nonskid Wax, Da-Co Plastic Gloss Special.
Marking: Listee's name and trade name.

DeGoss Laboratories, New York 33, N. Y.

"Amor Lustre Heavy Duty Self Polishing Wax Pure" (FTM-1).
Marking: Listee's name and trade name.

Delta Chemical Co., Memphis 4, Tenn.

"Delta Self Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Demers, George J., Albany 3, N. Y.

Type FTM-3: San-Ell Floor Conditioner-Cleaner.
Marking: Listee's name and trade name.

Detroit Chemical Supply Co., Detroit 7, Mich.

"Marvel Gloss Non-Slip Floor Wax" (FTM-1).
Marking: Listee's name and trade name.

DeWitt Supply Co., The, Atlanta 1, Ga.

Type FTM-1: DeWitt Witt-Gloss Non-Slip Wax, DeWitt Witt-O-Brite, Witt-O-Film Waxless Floor Finish, DeWitt Formula D-12, DeWitt Witexo.
Marking: Listee's name and trade name.

Diamond Head Oil Refining Co., Inc., Kearny, N. J.

Type OGA: Dri-Z-All.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Diversey Corp., The, Chicago 13, Ill.

Type FTM-1: *Plyowax CN, Plyowax FF, Plyowax NS.* Type OGA: Pick-Up, Nabsoil.
Marking: Listee's name and trade name.

Dixie Disinfecting Co., Dallas 2, Texas.

Type FTM-1: Heavy Duty Dix-O-Wax, Dix-O-Wax Anti-Slip, Dix-O-Wax 18. Type FTM-3: Glaze-It.
Marking: Listee's name and trade name.

Dolan Maintenance Products Co., New York 54, N. Y.

Type FTM-1: Non Scuff, No-Rub, Pro-Tek, Hi-Glo, Water Emulsion Paste Wax, Dolanite. Type FTM-3: Flor-Kleener. Type FTM-5: Formula #77 Paste Wax.
Marking: Listee's name and trade name.

Dolge Co., The C. B., Westport, Conn.

"Saflac," "Shurstep," "Economy Water Wax," "Formula 400," "Formula 410," "Formula 420," "Formula 500," "Formula 510," "Formula 520," "Old Reliable Water Wax," "Dolcowax," "Dolcowax XL," "Lobbywax," "Nofals," "Hysol" (FTM-1); "Dolcorock," "Terrazzovar," and "Numastic" (FTM-2).
Marking: Listee's name and trade name.

Donnelly Products Co., Alexandria, Va.

Type FTM-1: Lustre Cote #16 Certified H-D Wax.
Marking: Listee's name and trade name.

Dri-Rite Co., The, Chicago 10, Ill.

"Dri-Rite," "Safe-T-Dry," "Ever-Dry," (OGA).
Marking: Listee's name and trade name.

DuBois Chemicals, Inc., Cincinnati 2, Ohio.

Type FTM-1: Neutra-Gloss, Flo-Brite, Prestige.
Marking: Listee's name and trade name.

Du-Ev Products Co., Inc., Brooklyn 11, N. Y.

Type FTM-1: 12% Solids Du-Ev Liquid Anti-Slip Wax, 16% Solids Du-Ev Liquid Anti-Slip Wax, Du-Ev Liquid Anti-Slip Wax Slo-Pace, Depco Anti-Slip Waterproof Wax, Du-Ev Acra-Lite.
Marking: Listee's name and trade name.

duPont de Nemours & Co., Inc., E. I., Wilmington 98, Del.

Type FTM-1: DuPont High-Gloss Floor Wax, DuPont Slip-Retardant Floor Wax.
Marking: Listee's name and trade name.

Dura Wax Co., Inc., McHenry, Ill.

Type FTM-1: No. 412-A Self-Polishing Wax, No. 215-A Floor Finish, No. 418 Self Polishing Wax.
Marking: Listee's name and trade name.

Eagle Chemical Co., Chicago 12, Ill.

Type FTM-1: Hard-cote Floor Finish.
Marking: Listee's name and trade name.

Eagle-Picher Co., The, Cincinnati 1, Ohio.

Type OGA: Eagle-Picher Floor-Dry No. 85.
Marking: Listee's name and trade name.

East Coast Soap Corp., Brooklyn 31, N. Y.

Type FTM-1: Coronet Lustre-Gloss Wax, Top-Gloss New Dimension Industrial Floor Finish, 1000 C-H Floor Finish.
Marking: Listee's name and trade name.

Easterday Supply Co., Los Angeles 1, Calif.

Type FTM-1: *Superl 2-Star Wax,* Safe-T-Shine, Safe-T-Gloss, 4-Star Wax, 5-Star Wax.
Marking: Listee's name and trade name.

Eastern Supply, Inc., Rockville, Md.

Type FTM-1: Diamond Water Emulsion Paste Wax.
Marking: Listee's name and trade name.

Economics Laboratory, Inc., St. Paul 1, Minn.

Type FTM-1: EL Floor Finish, EL Water Resistant Wax, EL Slip Resistant Wax.
Marking: Listee's name and trade name.

Edsan Chemical Co., New Haven, Conn.

Type FTM-1: V Wax B, Edsan 48 Safety Floor Finish.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Edward-Councilor Co., Inc., Norfolk 7, Va.

"Radiant-Glo Self-Polishing Liquid Wax," "Radiant-Glo Heavy Duty Wax" (FTM-1); "Radiant-Glo Cleaner" (FTM-3).
Marking: Listee's name and trade name.

El Camino Supply Co., San Carlos, Calif.

Type FTM-1: Regal Heavy Duty Wax, Regal Self-Polishing Wax, Regal Brite Lustre, Regal Heavy Duty Safety Step, Regal Safe Glow.
Marking: Listee's name and trade name.

Electrolux Corp., New York 36, N. Y.

Type FTM-1: Electrolux High Lustre Wax, Electrolux Special Wax. **Type FTM-4:** Electrolux Cleaning-Polishing Wax.
Marking: Listee's name and trade name.

Elliott's, Lawrence, Mass.

Type FTM-1: Elliott's Floor Wax.
Marking: Listee's name and trade name.

Emerson Chemical Products Co., Norristown, Pa.

Type FTM-1: Emerson Self-Polishing Wax, Emerson Floor Finish.
Marking: Listee's name and trade name.

Empire Chemical Co., Los Angeles 31, Calif.

Type FTM-1: Sure-Tred, Lustro, Emco Plax Floor Finish.
Marking: Listee's name and trade name.

Empire Chemical Products Co., Newark 2, N. J.

Type FTM-1: Flo-On Slip Resistant Floor Wax, Empire Maintenance High Grade Service Wax, Easy-On, Easy-On Gold Stripe, Quick-Buf, Super Slow, No Buf Finish #61, Empire 81 Asphalt Paste Wax, Traflex 63.
Marking: Listee's name and trade name.

Engler Chemical Co., Los Angeles 48, Calif.

Type FTM-1: M-30 Special Formula.
Marking: Listee's name and trade name.

Enterprise Chemical & Paper Corp., New York 36, N. Y.

Type FTM-1: Enco Gleam O Lac Floor Finish, Enco Glass Wax, Enco Sure Grip Wax, Enco Gloss Wax #50, Enco Gloss Wax Supreme, Enco Pride Safety-Floor Finish No. 500. **Type FTM-3:** Enco Just, Enco Shine Cleaner.
Marking: Listee's name and trade name.

Essential Chemicals Co., Milwaukee 17, Wis.

Type FTM-1: PM Safety Shine Floor Finish 270-A, -B, -R, -T, -V, -X.
Marking: Listee's name and trade name.

Excel Chemical Co., Milwaukee 3, Wis.

Type FTM-1: Excel Floor Wax.
Marking: Listee's name and trade name.

Excelsior Varnish, Inc., Cleveland 2, Ohio.

Type FTM-1: 402D-2 Vinyl-Asphalt Rubber Tile Protector, 264C-12 High-Gloss Hard Dry Wax, PW151A12 Federal Specification Wax, 264-B Bright Drying Wax, 264-H High Luster Wax, 264SR Waterproof Floor Wax. **Type FTM-2:** GE78-40 Extra Pale Color Gym Floor Finish, GE73-40 China Wood Oil Bakelite Gym Floor Finish, GE90-40 Eposeal Epoxy Resin Gym Floor Sealer and Finish, GE79 Thru-Tempered Gym Floor Finish, MO872 All Penetrating Sealer and Finish and Extra Pale, V419 Water Clear Terrazzo Sealer.
Marking: Listee's name and trade name.

Federal Varnish Div., Enterprise Paint Mfg. Co., Chicago 8, Ill.

Type FTM-1: Lightning Lustre Wax, 333 Self-Polishing Wax, Slo-Tred, Code No. L-1370, Sil-Lox, Silakone-Gloss, Super Lustre Floor Wax, Code No. L-1669 Gloss Grip, Asphalt Tile Cleaner and Conditioner, Super Lightning Lustre Heavy Duty Wax-16, Super Lightning Lustre Heavy Duty Anti-Slip Wax-16, Rez-Em Resin Emulsion, Garda Floor, Surfa-Safe, Carnaub-All, Terracote. **Type FTM-2:** No-Burn Gym Finish, No-Burn Gym Finish L-1248, Fed-Co Penetrating Sealer, Mastic Tile Sealer, Asphalt Tile Finish, Code No. L-1397, Terrazzo Sealer, Terrazzo Finish, Quick-Prime, Dri-Fast Seal & Finish, Penetroil Sealer, No. 70 Restorer and Finish, Code No. L-1354, Code No. L-1355, Code No. 2110 or 2135, Code No. 2140, L-1508 Sealer, CPR Finish, Flex-Cure-Seal.
Marking: Listee's name and trade name.

Ferris, Jr., Inc., John, Albany 7, N. Y.

Type FTM-1: Superior Self Polishing Wax, Superior 18 Self Polishing Wax, Super Self Polishing Wax. **Type FTM-3:** Superior Floor Cleaner.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Finch Janitor Supply, Carl, Little Rock, Ark.

Type FTM-1: Glo-Grip, Super Glo-Grip, Perma-Trate, Super Perma-Kote, Perma-Kote.
Marking: Listee's name and trade name.

Finnell System, Inc., Elkhart, Ind.

Type FTM-1: Fino-Dox HC, Fino-Dox TC, Fino-Dox EX, Fino-Gloss HC, Fino-Gloss TC, Fino-Gloss EX, Fino-Gloss, Safety Base. **Type FTM-3:** Sanax.
Marking: Listee's name and trade name.

Fischer-Lang & Co., Inc., Frederick, Md.

Type FTM-1: Flo Luster Heavy Duty Floor Wax, Flo Luster Special Heavy Duty Floor Wax, Secure Heavy Duty Floor Wax, Flo Glaze Floor Finish. **Type FTM-2:** F-L Asphalt Tile Seal & Finish, Contreat Concrete Sealer. **Type FTM-3:** Syn-X Concentrate All-purpose Cleaner.
Marking: Listee's name and trade name.

Fitch Dustdown Co., The, Baltimore 30, Md.

Type FTM-1: Fidusco Super Heavy-Duty Wax with Ludox.
Marking: Listee's name and trade name.

Flex-O-Lite Associates, Itasca, Ill.

Type FTM-1: Flex-O-Lite All-Purpose Wax, Flex-O-Lite Flexible Film Finish (Buffable), Flex-O-Lite Flexible Film Finish, Flex-O-Lite Slip Retardant Wax, Flex-O-Lite Standard Duty Wax.
Marking: Listee's name and trade name.

Flexrock Co., Philadelphia 1, Pa.

Type FTM-1: Flexrock Less Slip Wax.
Marking: Listee's name and trade name.

Flintkote Co., The, New York 20, N. Y.

Type FTM-4: Flintdek Anti-Slip Coating.
Marking: Listee's name and trade name.

Floor Maintenance Bureau, Inc., Lodi, N. J.

Type FTM-1: "FMB Self-Polishing Floor Wax," "FMB Asphalt Paste Wax," "FMB Self-Polishing Wax Super."
Marking: Listee's name and trade name.

Floors, Inc., Atlanta, Ga.

Type FTM-1: Mar-Pol Hard-Glo Liquid Wax, Mar-Pol Pantaloon, Mar-Pol Formula No. 9, Mar-Pol Formula #72, Mar-Pol Formula #45.
Marking: Listee's name and trade name.

Flor-Dry Co., The, St. Paul 4, Minn.

"Cal-Flor-Dry" or "Flor-Kleen all Purpose" (OGA).
Marking: Listee's name and trade name.

Floridin Co., Tallahassee, Fla.

Type OGA: Florco.
Marking: Listee's name and trade name.

Foray Supply Co., Stamford, Conn.

Type FTM-1: Hyalite High Grade Anti-Slip, Hyalite Utility Anti-Slip, Hyalite Supreme Anti-Slip, Hyalite Floor Finish. **Type FTM-3:** Hyalene Concentrated Neutral Cleaner & Conditioner.
Marking: Listee's name and trade name.

Formula Floor Products, Inc., Newark 5, N. J.

Type FTM-1: Formula No. 87 Water Emulsion Paste Wax, Formula No. 89, Formula No. 100. **Type FTM-3:** Formula No. 37, A-1, Formula Clean-Up.
Marking: Listee's name and trade name.

Franklin Research Co., Philadelphia 31, Pa.

Type FTM-1: Rubber Gloss, Franklin's 21 Wax, Franklin's Slo-Surface Floor Polish, Franklin's 16% Wax, Franklin's 2602-A Anti-Slip Wax, Franklin's Brite Wax, Franklin's Cement Treatment, Franklin's Triple Life Finish for Floor, Franklin's Award Anti-Slip Floor Finish, Franklin's Emulsion Paste Wax, Franklin's 1600 Wax, Franklin's W-8 Spec Wax, Poly-Resin Floor Polish, Franklin's Treadwear Floor Finish. **Type FTM-2:** Franklin's Chekit Penetrating Seal, Franklin's TCM Sealer, Franklin's Chekit High Gloss Finish, Franklin's Clear Seal, Franklin's Treb. **Type FTM-3:** Rubber-Gloss Cleaner, Franklin's Sealit, Franklin's Liquid Detergent, Ammoniated Speedsope, Franklin's Brite Concentrate, Franklin's Flormycin Germicidal Detergent.
Marking: Listee's name and trade name.

Frommeier Laboratories, Inc., St. Louis 13, Mo.

Type FTM-4: Clic Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Fruchtman Floor Supply Co., Newark, N. J.

Type FTM-1: Harvey's Water Emulsion Floor Wax, Harvey's Safety Paste Wax. **Type FTM-5:** Harvey's Prepared Paste Wax.
Marking: Listee's name and trade name.

Fuld Bros., Inc., Baltimore 31, Md.

Type FTM-1: S12-S Self Polishing Liquid Wax, Formula X12-S Self Polishing Liquid Wax, Flor Glo Formula #70, Just Flexable Film Floor Finish, Milli-Mike Formula R-12 Self Polishing Liquid Wax, Formula M12 Wax, Just Self Polishing Liquid Wax, Formula 909 Polymer Dry-Cleaner-Polish. **Type FTM-3:** Fulshine Cleaner, Just Cleaner-Disinfectant.
Marking: Listee's name and trade name.

Furst-McNess Co., Freeport, Ill.

Type FTM-1: McNess Floor Glaze.
Marking: Listee's name and trade name.

Galer & Hults, Inc., Philadelphia 19, Pa.

Type FTM-1: G & H Standard Wax, G & H Super Wax. **Type FTM-3:** Florcon.
Marking: Listee's name and trade name.

Gasser, William J., Brooklyn 5, N. Y.

Type FTM-5: Floor Shine Paste Wax.
Marking: Listee's name and trade name.

Gast & Sons Co., P. B., Grand Rapids 7, Mich.

Type FTM-1: Grip Tread Floor Coat 12.
Marking: Listee's name and trade name.

Gateway Chemical Co., Inc., Kansas City 8, Mo.

Type FTM-1: E Z Luster, Super Luster, Formacote, Safetycote, Good Gloss Wax.
Marking: Listee's name and trade name.

Gem Products & Mfg. Co., Detroit 8, Mich.

Type FTM-1: Flor-Pride Floor Wax, Flor-Pride Industrial Concentrate, Flor-Pride Special Antialip. **Type FTM-2:** Gem-Roc. **Type FTM-3:** Gem Shine Cleaner.
Marking: Listee's name and trade name.

General Laboratories, Inc., Muskegon, Mich.

Type FTM-1: Scotch-Sheen.
Marking: Listee's name and trade name.

General Tire & Rubber Co., The, Building Materials Div., Akron 9, Ohio.

Type FTM-1: Bolta-Floor High Gloss Floor Finish. **Type FTM-3:** Bolta-Floor High Speed Floor Cleaner.
Marking: Listee's name and trade name.

Gerson-Stewart Corp., Cleveland 4, Ohio.

Type FTM-1: Safesheen, Buffable Safesheen Floor Finish, Super Safesheen Floor Finish, Grip Safe Wax, Gersonite Floor Finish.
Marking: Listee's name and trade name.

Giles Varnish Co., Inc., College Point 56, N. Y.

Type FTM-2: U-40 Gym Finish.
Marking: Listee's name and trade name.

Glidden Co., The, Cleveland 14, Ohio.

Type FTM-1: Glid-N Floor Wax.
Marking: Listee's name and trade name.

Globe Industrial Supplies, Indianapolis 4, Ind.

"Globe Three Ring Floor Finish" (FTM-1).
Marking: Listee's name and trade name.

Griffin Bros., Inc., Portland 2, Ore.

Type FTM-1: Var-Brite Wax 12.5%, Var-Brite Wax 14%, Var-Brite Wax 16%, Var-Brite Wax 18%, Safety Wax 12.5%, Safety Wax 14%, Safety Wax 16%, Griffin's Easy-Shine Liquid Wax 12.5%, Griffin's Easy-Shine Liquid Wax 14%, Griffin's Easy-Shine Liquid Wax 16%, Griffin's Easy-Shine Liquid Wax 18%, Griffin's High-Lustre Wax 12½%, Griffin's High-Lustre Wax 14%, Griffin's High-Lustre Wax 16%, Griffinoax, Griffin's Polymer, Griffin's Starlight.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Guardian Chemical Co., Atlanta 1, Ga.

Type FTM-1: Tred Pruf Wax, Lustra Liquid Wax, Stride, Wear Rite Liquid Wax, Hi-Top Floor Finish.
Marking: Listee's name and trade name.

Guest Paper Co., J. K., Paris, Texas.

"Daybright" (FTM-1).
Marking: Listee's name and trade name.

Haag Laboratories, Inc., The, Blue Island, Ill.

Type FTM-1: Chemi-Coat, Self-Polishing Wax, Safety Self-Polishing Wax.
Marking: Listee's name and trade name.

Hadco Corp., Cleveland 13, Ohio.

Type FTM-1: NS-20 Safety Floor Finish, Floor-Most Buffable Safety Floor Finish, Hadco Self-Polishing Safety Floor Wax. Type FTM-3: All-Kleen H-D.
Marking: Listee's name and trade name.

Hall-Watson Co., Inc., The, New York 17, N. Y.

Type FTM-1: Economite Hard Sheen Liquid Wax.
Marking: Listee's name and trade name.

Hanson-Loran Chemical Co., Long Beach 5, Calif.

Type FTM-1: Kata Non-Skid Floor Wax.
Marking: Listee's name and trade name.

Harvard Brush Co., Tulsa 16, Okla.

"Stabrite," "Stabrite Anti-Slip" (FTM-1).
Marking: Listee's name and trade name.

Haynes Products Co., Omaha 3, Neb.

"Sand Wax" (FTM-1).
Marking: Listee's name and trade name.

Heckman-Eifrig Co., Chicago 24, Ill.

Type FTM-1: H-E Vinyl Dressing.
Marking: Listee's name and trade name.

Hel-Mar, Inc., Portland 17, Ore.

"Hel-Mar Wax No. 12" (FTM-1).
Marking: Listee's name and trade name

Hercules Flooring Co., New York 11, N. Y.

"Hercules Floor Wax," "Hercules Slo Pace Anti-Slip Wax" (FTM-1).
Marking: Listee's name and trade name.

Hertron Chemical Co., Charlotte, N. C.

Type FTM-2: Hertron Terrazzo Sealer and Finish, Hertron Terrazzo and Tile Wax. Type FTM-3: Hertron Neutral Terrazzo Detergent.
Marking: Listee's name and trade name.

Higley Chemical Co., Dubuque, Iowa.

Type FTM-1: Shield Liquid Wax, Cling, Hitone and Higley Anti-Slip Liquid Wax.
Marking: Listee's name and trade name.

Hild Floor Machine Co., Inc., Chicago 7, Ill.

Type FTM-1: Shine Bright Cleaner No. 2B, Hard Finish Floor Wax No. 200, Standard Floor Wax No. 300, Special Floor Wax No. 400, Safety Waxless Floor Finish No. 500, Water Emulsion Paste Wax No. 700, Price Wax No. 800, Heavy Duty Wax No. 900. Type FTM-2: Gym Finish Seal No. 11, Penetrating Seal No. 22, Wax Base Cleaner and Finish No. 6F, Terrazzo Seal No. 33, Special Concrete Seal No. 44, Fast Dry Seal No. 17, Asphalt Tile Sealer No. 18.
Marking: Listee's name and trade name.

Hill Mfg. Co., Atlanta 15, Ga.

Type FTM-1: Hilco-Gloss Super Safe-No Wax Floor Finish.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Hillyard Chemical Co., St. Joseph 1, Mo.

Type FTM-1: Super Hil-Brite, Hil-Tex, Liquid Wax No. 214, Hil-Brite, Super Hil-Lustre, Poly-Kote, #258 Floor Coating, #507 Liquid Wax, Improved Poly-Kote. **Type FTM-2:** Onex-Seal, Natural Onex-Seal, Special Onex-Seal, Super Onex-Seal, Terraz-zine, Hillyard Trophy Wood Seal, Hillyard Trophy Gym Finish, Star Gym Finish, Con-Seal. **Type FTM-3:** Super Shine-All, Regular Shine-All, Re-Juv-Nal, #153 Synthetic Cleaner. **Type FTM-5:** Hil-Kote, Liquid Wax No. 33.
Marking: Listee's name and trade name.

Hirschel Co., F. H., Silver Spring, Md.

Type FTM-1: Satin Flowing Wax, Satin Flowing 18% Heavy Duty Wax. **Type FTM-4:** Satin Flowing Wax Remover, Satin Flowing Liquid Detergent, Satin Flowing Cleaner.
Marking: Listee's name and trade name.

Hockwald Co., The, San Francisco 24, Calif.

Type FTM-1: Super Extra Heavy Duty Wax, Blue Label Rubless Wax, Flo-Grip, Super Flo-Grip, Safeluster Rubless Wax, So-Lustre No-Slip Floor Coating, Hockwald's K200, Super Safe-Life No Buff, Hockwald's Super Spar-Kel. **Type FTM-2:** Penetrating Seal No. 1 Light Clear, Light Clear Gym Finish No. 4. **Type FTM-3:** Super Linol. Hockwald's San-O-Six, Hockwald's Klass LF Concentrate, Supreme Cleaner. **Type FTM-5:** Safe Glow. **Type FTM-6:** Dustol 25.
Marking: Listee's name and trade name.

Holcomb Mfg. Co., Inc., J. I., Indianapolis 7, Ind.

Type FTM-1: Holcomb Water-proof Wax, Holcomb Anti-Skid Wax, Holcomb Clad Wax, Holcomb Hy-Sheen Wax, Holcomb Signet Wax, Holcomb Heavy Duty Institute Wax, Holcomb Heavy Duty Institute Wax 18%, Holcomb Heavy Duty Professional 12, Holcomb Heavy Duty Professional 18, Holcomb Professional Wax No. 19, Holcomb Professional Wax No. 27, Holcomb Professional Wax No. 46, Holcomb Halt, Holcomb Professional Waxless Floor Finish No. 73. **Type FTM-2:** Holcomb Composition Floor Seal, Holcomb Terrazzo Seal. **Type FTM-3:** San-I-Det, AP34.
Marking: Listee's name and trade name.

Hollingshead Corp., R. M., Camden 2, N. J.

Type FTM-1: Bell System Liquid Floor Wax, Triple Service Self-Polishing Wax, All Nu Self-Polishing Wax, Heavy Duty Self-Polishing Wax, Whiz Acrylic Finish. **Type FTM-2:** Industrial Floor Show.
Marking: Listee's name and trade name.

Holly Maintenance Supply Co., Inc., Los Angeles 36, Calif.

Type FTM-1: Holly #950 Anti Skid Floor Finish.
Marking: Listee's name and trade name.

Hoover Co., The, North Canton, Ohio.

Type FTM-1: Hoover Floor Wax.
Marking: Listee's name and trade name.

Horn Cos., A. C., North Bergen, N. J.

Type FTM-3: Horn 45-11 Standard Cleaner, Hornbrite Cleaner, Horn Maintenex.
Marking: Listee's name and trade name.

Hospital Bureau of Standards & Supplies, Inc., New York 17, N. Y.

"Hosburo Self-Polishing Liquid Wax" (FTM-1).
Marking: Listee's name and trade name.

Houston Paper Co., Houston, Texas.

Type FTM-3: Olympic No. 29 Du-Mor Cleaner.
Marking: Listee's name and trade name.

Howard Chemical Co., The, New Haven 11, Conn.

"Howard Heavy Duty Floor Wax" (FTM-1).
Marking: Listee's name and trade name.

Hubman Supply Co., The, Columbus 8, Ohio.

Type FTM-1: Fortress Heavy Duty Floor Wax, Protek, Ultra-Cote.
Marking: Listee's name and trade name.

Hunter Co., The, San Antonio 5, Texas.

Type FTM-1: Hunter's Sure-Tread Self-Polishing Wax, Hunter's B&H Self-Polishing Wax, Hunter's No. 114-AS Self-Polishing Wax, Hunter's No. 7-114 Self-Polishing Wax, Hunter's No. 7-118 Self-Polishing Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Huntington Laboratories, Inc., Huntington, Ind.

Type FTM-1: Weatherall, Neo-Shine, Eagle, Falcon, Cosmolite Antislip Wax, Sana-Shine, Bristolite, Contrast.
Marking: Listee's name and trade name.

Hunt Mfg. Co., Cleveland 4, Ohio.

Type FTM-1: Floor Wax No. 2941-A, Floor Wax No. W-4184, W-3366 Floor Wax, W3546 Plastic Floor Finish, W-4116 Plastic Floor Finish, W5785 Floor Finish.
Marking: Listee's name and trade name.

Hysan Products Co., Chicago 9, Ill.

Type FTM-1: Hyper Liquid Wax, Super Liquid Wax, Balawax, No. 1822, Hysafe.
Marking: Listee's name and trade name.

I & I Supply Co., Portland 9, Ore.

"I & I Superior Gloss Heavy Duty," "I & I Hard Gloss Heavy Duty," "I & I Safe Tread Heavy Duty" (FTM-1).
Marking: Listee's name and trade name.

Independence Chemical Co., Gloucester City, N. J.

Type OGA: Indco.
Marking: Listee's name and trade name.

Industrial Chemical Div., Leo Silfen, Inc., Mount Vernon, N. Y.

Type FTM-1: Industrial Heavy Duty Floor Wax, Formula 1000 Safety Floor Finish, Formula 1000 XX Safety Floor Finish, Formula #1 Safety Floor Wax, All Weather Floor Finish. **Type FTM-3:** Formula #2 Floor Conditioner and Cleaner, Formula 101 Floor Conditioner and Cleaner.
Marking: Listee's name and trade name.

Industrial Chemical Laboratories, Inc., Omaha 2, Neb.

Type FTM-1: Non-Skid Self-Polishing Wax, *Industrial No. 90 Wax*, SeCur Wax, Non-Skid Quickshine Wax, Industrial Nu-Cote, Ultra-Lite.
Marking: Listee's name and trade name.

Industrial Floor Finishes, Inc., Bedford, Mass.

Type FTM-1: Permanize Safety-Emulsion Liquid Wax, Permanize Heavy-Duty Liquid Wax, Permanize 12% Special Liquid Wax, Permanize Self-Polishing Liquid Wax.
Marking: Listee's name and trade name.

Industrial Soap Co., St. Louis 3, Mo.

Type FTM-1: Fanfare Floor Wax.
Marking: Listee's name and trade name.

Institutional Distributors Co., Lynbrook, N. Y.

Type FTM-1: Diaflex Gym Finish.
Marking: Listee's name and trade name.

Institutional Supply & Chemical Co., Long Island City, N. Y.

Type FTM-1: *Surfacetone Safety Floor Finish.* **Type FTM-3:** Surfacetone Formula 44 Concentrated Cleaner.
Marking: Listee's name and trade name.

Inter-City Chemical Co., New York 18, N. Y.

"HB-2 Wax" (FTM-1).
Marking: Listee's name and trade name.

International Metal Polish Co., Inc., Indianapolis 7, Ind.

"Blue Ribbon Self-Polishing Wax" (Formula No. F-205), "Blue Ribbon Super-Duty Wax" (Formula No. F-206), "Blue Ribbon No-Buffing Wax" (Formula No. N-201), "W-220 Super Waterproof Wax," "Blue Ribbon Double Duty Floor Wax" (FTM-1); "Blue Ribbon Liquid Floor Wax" (Formula No. F-204), "Blue Ribbon Paste Floor Wax" (Formula No. F-207) (FTM-5).
Marking: Listee's name and trade name.

Iron City Wiping Materials Co., Pittsburgh 19, Pa.

"Lustre Shine," "Paramount," "Supreme" (FTM-1); "Ruby-Gloss" (FTM-3).
Marking: Listee's name and trade name.

Island Supply Co., Babylon, N. Y.

Type FTM-1: Island's Anti-Slip Floor Finish, Island's Waterproof Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Janitorial Supply Co., Wallington, N. J.

Type FTM-1: Steelcoat.
Marking: Listee's name and trade name.

Janitors Supply & Chemical Co., Greenville, S. C.

Type FTM-1: Guide 19 Liquid Wax, Guide Gloss Liquid Wax, Guide Safe Surface Liquid Wax. **Type FTM-2:** Guide Beauti-Gloss Finish, Guide Penetrating Seal. **Type FTM-3:** Guide Detergent-F, Guide Esy-Strip.
Marking: Listee's name and trade name.

Jersey Janitor Supply, Newark 2, N. J.

Type FTM-1: Clover Super X Floor Finish. **Type FTM-3:** Clover Jetsoap Concentrate.
Marking: Listee's name and trade name.

Jewel Tea Co., Inc., Barrington, Ill.

Type FTM-1: Skid Resistant Floor Wax A, Jewel Hi-Gloss Floor Wax, Air Maid Self-Polishing Floor Wax, Jewel Heavy Duty Floor Wax.
Marking: Listee's name and trade name.

Johns-Manville Sales Corp., New York 16, N. Y.

Type FTM-1: J-M Floor Tile Wax, Johns-Manville Self-Polishing Vinyl Floor Finish. **Type FTM-3:** J-M Floor Tile Cleaner.
Marking: Listee's name and trade name.

Johnson Co., Walter H., Seattle 9, Wash.

"Jonquil Self Polishing Wax," "Jonquil A-S Wax," "Jonquil GSA" (FTM-1).
Marking: Listee's name and trade name.

Johnson & Son, Inc., S. C., Racine, Wis.

Type FTM-1: Brown Label No-Buff, Green Label No Buff, Heavy Duty Hard Gloss, Hard Gloss Glo-Coat, Stride, Waxtra, Klear, Johnson's Step Ahead, Super Shur-Trol. **Type FTM-2:** Terra-New Sealer Finish, Traffic-Cote Floor Sealer, Red Label Gym Finish, Conq-R-Dust Sealer Finish. **Type FTM-3:** Forward, Emerel Cleaner, Blue Chip, Wax-Strip Floor Cleaner. **Type FTM-5:** Johnson's Tranparent Traffic Wax, Traffic Wax Liquid, Traffic Wax Paste, Beautiflor, Johnson's Paste Wax.
Marking: Listee's name and trade name.

Jones Products Co., Arlington 74, Mass.

"Commander Imperial," "Sparkle" (FTM-1).
Marking: Listee's name and trade name.

Kamo Mfg. Co., Augusta, Ga.

"Lustre-Kote" (FTM-1).
Marking: Listee's name and trade name.

Kapco Industries, Inc., New York 17, N. Y.

Type FTM-1: Kapco Super Hi-Flex Floor Finish, Kapco No. 200 Liquid Floor Wax with Dupont Ludox. **Type FTM-3:** Kapco No. 10 Concentrate Synthetic Floor Cleaner, Kapco Neutra Sheen, Kapco No. 100 Concentrate Synthetic Floor Cleaner.
Marking: Listee's name and trade name.

Karen Janitorial Supply Co., Union, N. J.

"Karen-Gloss All Purpose Cleaner," "Karen-Gloss All Purpose Asphalt Cleaner," "'Color Bright' Karen-Clean Concentrate" (FTM-3).
Marking: Listee's name and trade name.

Kay Chemical Co., High Point, N. C.

Type FTM-2: Kaydet Floor Finish, Kaydet Penetrating Sealer.
Marking: Listee's name and trade name.

Keane Products Co., Camden 3, N. J.

Type FTM-1: Kustodial Floor Finish, Kustodial Heavy Duty Floor Wax, Kustodial Extra Heavy Duty Floor Wax, Kustodial Extra Heavy Duty Floor Wax Fortified with Dupont's Ludox, Kustodial Heavy Duty Floor Wax Fortified with Dupont's Ludox, Kustodial Master Floor Wax.
Marking: Listee's name and trade name.

Kem Products Corp., Brooklyn 31, N. Y.

Type FTM-1: Gable Emulsion Paste Wax, Gable Floor Finish, Gable Non Rubbing Floor Wax. **Type FTM-5:** Gable Paste Wax.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Kentile, Inc., Brooklyn 15, N. Y.

Type FTM-1: Kenwax Self Polishing Floor Wax, Kengrip, Kentile Vinyl Floor Finish.
Marking: Listee's name and trade name.

Kerns Chemical Corp., J. F., Chicago 18, Ill., El Monte, Calif.

Type FTM-1: Flor Care.
Marking: Listee's name and trade name.

King Chemical Co., Mount Vernon, N. Y

"Wonder-Zorb" (OGA).
Marking: Listee's name and trade name.

Kleen-All Products Co., Milwaukee 3, Wis.

"No-Slip Liquid Floor Wax" (FTM-1).
Marking: Listee's name and trade name.

Klix Chemical Co., South San Francisco, Calif.

Type FTM-1: Super Gloss, KW-120, Gloss Cote.
Marking: Listee's name and trade name.

Kruss-Harding Supply, Inc., San Mateo, Calif.

Type FTM-1: K-H Floor Finish.
Marking: Listee's name and trade name.

Lab Automated Chemicals, Baltimore 30, Md.

Type FTM-1: Cetox, Lab Cote, Lab Trans-Lite Wax, Lab Wash'n Wear. Type FTM-3: Lab One, Lab-52.
Marking: Listee's name and trade name.

Lamco Chemical Co., Inc., Boston 10, Mass.

Type FTM-1: Self-Polishing Liquid Deluxe Slip-Resistant Floor Wax, Self-Polishing Lamco #499 Slip-Resistant Floor Wax, Self-Polishing Liquid Superior Slip-Resistant Floor Wax, Waterproof Washable Slip-Resistant Extra Heavy Duty Industrial Water Emulsion Floor Wax, Self-Polishing Liquid Lamco #22 Slip-Resistant Floor Wax, Self-Polishing Liquid Lamco Deluxe Light Safety Slip Retardant Floor Wax, Asphalt Tile Wax, High Gloss Masterpiece, Lamco Floor Dressing, Super Duty Yellow Label Institutional Floor Wax, Red Label Institutional Floor Wax, Green Label Institutional Floor Wax, Heavy Duty Blue Label Institutional Floor Wax, Lamco Safety Buffable Floor Finish, Lamco Safety Floor Finish. Type FTM-3: Lamco Prevent-O-Slip, Lamco Protekto-Seal.
Marking: Listee's name and trade name.

Lancer Specialties, Lawrence, Mass.

Type FTM-1: Eze-Flo, Resisto Anti-Slip Wax, Tuffe Heavy Duty Wax, Lancer Floor Finish.
Marking: Listee's name and trade name.

Lavo Co. of America, Milwaukee 12, Wis.

Type FTM-1: Kwikgloss, Kwikshine, Kwikshine 97.
Marking: Listee's name and trade name.

Lawrence Laboratories, S., Chicago 5, Ill.

"Roma Lustre Wax" (FTM-1); "Roma Lustre Element Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Legge Co., Inc., Walter G., New York 17, N. Y.

Type FTM-1: Safco, Leco, Floor Shine, Sure Tred 130, Trafleco, Legsure. Type FTM-3: Spirco Cleaner, Trafco Cleaner. Type FTM-5: Spirco, Trafco.
Marking: Listee's name and trade name.

Lester Laboratories, Inc., Atlanta 2, Ga.

Type FTM-1: Peer Self-Polishing Wax, Les-Slip Floor Gloss.
Marking: Listee's name and trade name.

Levit, Harry, Chicago 49, Ill.

"Ace-High Self-Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Lien Chemical Co., Franklin Park, Ill.

Type FTM-1: No. 292 Grip Step Floor Wax, No. 334 Super Film Floor Wax, No. 335 [illegible] Floor Wax, No. 397 Clien-Gloss.
Marking: Listee's name and trade name.

Floor Coating and Finishing Material—*Continued*

Loumac Supply Corp., New York 29, N. Y.

Type FTM-1: Lem-Glo Triple A Non-Skid No Rubbing Liquid Wax, Lem-Glo Triple A Anti-Skid No Rubbing Liquid Wax. Type FTM-3: Conducti Kleen, Lem-Glo Neutral Kleen.
Marking: Listee's name and trade name.

Lovinger Disinfectant Co., Salt Lake City 10, Utah.

"Lustre Shine," "Traffic Wax," "Lov-Fast" (FTM-1).
Marking: Listee's name and trade name.

Lu Bar Co., Kansas City 8, Mo.

Type FTM-1: 4D Wax, 5-LD Wax.
Marking: Listee's name and trade name.

Lu-Mar Chemical Products Co., Newark 5, N. J.

Type FTM-1: Lu-Mar Emulsion Paste Wax.
Marking: Listee's name and trade name.

Lunax Chemical Co., Chicago 32, Ill.

Type FTM-1: Lunax Nowax, Lunax Carnauba Liquid Wax. Type FTM-2: Lunax Gym Finish. Type FTM-3: Lunax Cleaner.
Marking: Listee's name and trade name.

Lystad & Redick, Inc., Grand Forks, N. D.

Type FTM-3: Lystad's Concentrate, Lystad's Medi-Clean, Lystad's Scuff Resistant. Type FTM-6: Magic Polish.
Marking: Listee's name and trade name.

M & H Laboratories, Inc., Chicago 8, Ill.

Type FTM-1: M & H Self-Polishing Floor Wax, Floor Groom, IHL Self Polishing Wax, X-L, X-L-L, M & H No-Buff.
Marking: Listee's name and trade name.

McAleer Mfg. Corp., Detroit 17, Mich.

"McAleer Tuff-Kote Wax," "McAleer Red Band," "McAleer Black Band" (FTM-1).
Marking: Listee's name and trade name.

McVicker Co., W. B., Brooklyn 17, N. Y.

"Double Service" (FTM-1).
Marking: Listee's name and trade name.

Magee Chemical Co., Bensenville, Ill.

Type FTM-1: Tough Luster, Grip Fast, Inner Lock, All Brite, Econo Wax, Tuff Lite, Vinilite, Lastex, School Master Wax, Lamanite.
Marking: Listee's name and trade name.

Magnet Cove Barium Corp., Houston 5, Texas.

Type OGA: Dresser Dri.
Marking: Listee's name and trade name.

Magnet Paint & Shellac Co., Brooklyn 4, N. Y.

Type FTM-5: "National Finish Wax."
Marking: Listee's name and trade name.

Magnolia Chemical Co. of Texas, Inc., Dallas 5, Texas.

Type FTM-1: Golden Gloss, Magnolia Slip Proof, Magna Gloss.
Marking: Listee's name and trade name.

Maintenance Products, Inc., Syracuse 2, N. Y.

Type FTM-1: Dries Bright, Supreme.
Marking: Listee's name and trade name.

Maintenance Supply Co., Inc., Huntersville, N. C.

Type FTM-1: Maintenance Flexible Floor Finish, Maintenance Heavy Duty Liquid Water Emulsion Wax with DuPont Ludox, Maintenance Heavy Duty Liquid Water Emulsion Wax, Maintenance Special Institutional Liquid Water Emulsion Wax with DuPont Ludox, Maintenance Supreme Liquid Water Emulsion Wax.
Marking: Listee's name and trade name.

Maintex, Inc., El Monte, Calif.

Type FTM-1: Bufftex, Hi-Grade Water Emulsion Floor Wax, Polymer #21
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Majestic Wax Co., Denver 2, Colo.

"Velva-Sheen" (FTM-2).
Marking: Listee's name and trade name.

Malter Supply Co., Inc., New Orleans 12, La.

Type FTM-1: Malco No-Wax Finish, Safe Step Self Polishing Wax.
Marking: Listee's name and trade name.

Maringer & Co., Chicago 30 Ill.

Type FTM-1: Maringer's Heavy Duty Self-Polishing Floor Wax, Maringer's Slip Resistant Self-Polishing Floor Wax, Flor-Life Buffable, Flor-Life Regular. All American Self Polishing Wax, Maringer's Slo-Traff-Ik Heavy Duty Wax, Maringer's Slo-Traff-Ik Wax. Type FTM-2: Marco Curing-Seal, Penetrating Seal, Maringer's Gym Finish. Type FTM-3: Maringer's Wax Soap Cleaner, Maringer's Ammoniated Strip-Soap, Maringer's Marble and Terrazo Cleaner.
Marking: Listee's name and trade name.

Marion Products Co., Chicago 6, Ill.

"Marion" (FTM-1).
Marking: Listee's name and trade name.

Martinez, Ramon, Larchmont, N. Y.

Type FTM-1: Sweeps-Take.
Marking: Listee's name and trade name.

Master Chemical Products, Inc., Wilkes-Barre, Pa.

Type FTM-1: Master Super Shine-Brite, Master Flexi-Cote Floor Finish, High Gloss Masterpiece. Type FTM-3: Super Master Sheen Cleaner.
Marking: Listee's name and trade name.

Masury-Young Co., Boston 29, Mass.

Type FTM-1: Solegrip, Myco Gloss, Myco Buffing Wax No. 15-284, Floor Safe, Myco Wax No. 202. Poly-Glo, First Coat, Myco 17-234. Type FTM-2: Myco Seal, Myco Trazeal, Myco Sealatex, Porfil, Myco Sheen, Mycolak, Mycobrite. Type FTM-3: Mycotrax, Mycoleum, Myco Dresoap, Pro-Mo-Lite, Myco 404 Cleaner, Strip-Kleen. Type FTM-6: Myco 8-45.
Marking: Listee's name and trade name.

Melflex Products Co., Inc., Akron 8, Ohio.

"Melflex Safety Tread," "Melflex Safety Warford" (WCM-2).
Marking: Listee's name and trade name.

Mercury Supply Co., Nashville 10, Tenn.

Type FTM-1: "Merco Self-Polishing Wax," "Merco Super Wax," "Mercury Special Wax."
Marking: Listee's name and trade name.

Metal Lubricants Co., Chicago 9, Ill.

Type OGA: Metalite All Purpose Oil.
Marking: Listee's name and trade name.

Metro Products Co., Atlanta 1, Ga.

Type FTM-1: Grip Sheen Wax, Grip Sheen Dubl-Kote Wax, Shyne Brite Wax, Shyne Brite Dubl-Kote Wax, Sta Brite Wax, Triple X Finish.
Marking: Listee's name and trade name.

Meyer & Son, Inc., H. B., Dallas, Texas.

Type FTM-1: Gleam Wax Self-Polishing Liquid Wax, Safway Slip-Resistant Self-Polishing Wax, Super Sheen 18 Heavy Duty Self-Polishing Wax, Shines-Well Self-Polishing Liquid Wax, Poly-Gloss, No. 2100 Waxless Floor Polish, No. 8100 Waxless Floor Polish. Type FTM-6: Spray Kleen.
Marking: Listee's name and trade name.

Michigan Products, Inc., Lansing 6, Mich.

Type FTM-1: Neuco Heavy Duty Floor Wax, Neuco Extra Heavy Duty 18%, Neuco Supreme Floor Wax, Neuco Super Supreme Floor Wax, Neuco Heavy Duty—Slip Resistant Floor Wax, Neuco Poly-Finish, Neuco Supreme—Slip Resistant Floor Wax 14%.
Marking: Listee's name and trade name.

Mid-City Supply Co., Chicago 5, Ill.

Type FTM-1: Central Self-Polishing Wax, Carnawax, Wasleff Self-Polishing Wax.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Mid-Continent Chemical Co., Oklahoma City 12, Okla.

Type FTM-1: Mid-Continent 3700 Self Polishing Wax, Plastic Gloss. Type FTM-2: Care.
Marking: Listee's name and trade name.

Midland Laboratories, Dubuque, Iowa.

Type FTM-1: Midland Ev-R-Glo Self-Polishing Wax, Midland Super Ev-R-Glo Self-Polishing Wax, Lohbrite Self-Polishing Wax. Type FTM-2: Midland Super Lohseal, Midland Gymloh, Mid-Seal, Midland Mid Cote, Mid-Dry Protective Floor Coating, Midland Master Finish, Midland Master Seal. Type FTM-3: Midland Soil Solv, ML-101 Concentrated All-Purpose Cleaner.
Marking: Listee's name and trade name.

Mid-West Chemical Co., Kansas City 5, Kan.

Type FTM-1: Mid-West Self-Polishing Wax.
Marking: Listee's name and trade name.

Milkex Specialty Co., Milwaukee 4, Wis.

Type OGA: Oil Zorb.
Marking: Listee's name and trade name.

Miller-Norris Co., Inc., Oklahoma City 1, Okla.

"Mirro-Glo," "Slip Free," "Mirro-Glo WR" (FTM-1).
Marking: Listee's name and trade name.

Milmark Laboratories, Div. of Mastic Tile Corp. of America, Houston 5, Texas.

Type FTM-1: Milmark Floor Tile Wax. Type FTM-3: Milmark Floor Tile Cleaner.
Marking: Listee's name and trade name.

Milwhite Co., Inc., The, Houston 20, Texas.

Type OGA: Georgia Mil-Sorb.
Marking: Listee's name and trade name.

Minerals & Chemicals Corp. of America, Attapulgus Div., Menlo Park, N. J.

Type OGA; Oil and Grease Absorbent.
Marking: Listee's name and trade name.

Minnesota Maintenance Co., St. Cloud, Minn.

Type FTM-1: Heavy-Duty Traffic Wax, Super Star-Brite Wax, Walkeze Wax.
Marking: Listee's name and trade name.

Miracle Chemicals, Inc., Grand Forks, N. D.

Type FTM-2: Miracle Polish.
Marking: Listee's name and trade name.

Mission Chemical Co., San Diego 1, Calif.

"Misco Brite," "Hi-Glo Wax," "Safloor Wax" (FTM-1); "Mical" (FTM-3).
Marking: Listee's name and trade name.

Missouri-Kansas Chemical Co., Kansas City 8, Mo.

Type FTM-1: Wonder Wax, Cello-Brite.
Marking: Listee's name and trade name.

Mitchell Chemicals & Paper Corp., Baltimore 1, Md.

Type FTM-1: Mitco #21 Waterproof Wax, Super Sheen Self Polishing Wax.
Marking: Listee's name and trade name.

Mitchell Mfg. Corp., John R., Mount Vernon, N. Y.

Type FTM-1: Mitco Super Asphalt Tile Wax.
Marking: Listee's name and trade name.

Momar, Inc., Atlanta, Ga.

Type FTM-1: Momar High Gloss Anti-Slip Wax.
Marking: Listee's name and trade name.

Monarch Chemical Laboratories, Inc., Baltimore 15, Md.

Type FTM-1: Monoshine #16 Waterproof Wax.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Monarch Chemicals, Inc., Minneapolis 21, Minn.

"Mon-O-Dri" (OGA).
Marking: Listee's name and trade name.

Monroe Co., Inc., The, Cleveland 6, Ohio.

"Skid-Not Plastic Floor Finish" (FTM-1).
Marking: Listee's name and trade name.

Moore, William A., Lexington 73, Mass.

Type FTM-1: Emulsion Floor Wax by William A. Moore, Safety-Emulsion Liquid Wax by William A. Moore.
Marking: Listee's name and trade name.

Moulder-Oldham Co., Tulsa 1, Okla.

Type FTM-1: Stabrite, Stabrite Slip-Resistance, *Stabrite Wax No. 16, Stabrite Lustre-Coat.*
Marking: Listee's name and trade name.

Multi-Care Corp., Scarsdale, N. Y.

Type FTM-1: Vinylustre Liquid, Terra-Lustre Polish. Type FTM-2: Ceram-YL Seal, Stone-YL Seal.
Marking: Listee's name and trade name.

Multi-Clean Products, Inc., St. Paul 16, Minn.

Type FTM-1: Waterproof Floor Wax Anti-Slip, Waterproof Floor Wax, Super Floor-Treat. Type FTM-2: Asphalt Tile Seal, Terrazzo Seal, Penetrating Wood Seal, Gym Finish, Concrete Preserver, Neo-Dry Concrete Sealer, Bakery Floor Preserver. Type FTM-4: Floor Dressing.
Marking: Listee's name and trade name.

Nash & Son, Inc., C. A., Norfolk, Va.

"Na-Nor Bowling Alley Wax—A Billiard Ball Finish" (FTM-1).
Marking: Listee's name and trade name.

National Chemical Laboratories of Pa., Philadelphia 47, Pa.

Type FTM-3: NAC-X Disinfectant-Cleaner Phenol Coefficient 6.
Marking: Listee's name and trade name.

National Chemsearch Corp., Dallas 26, Texas.

Type FTM-1: Everbrite Self-Polishing Floor Wax, Germax, Nu-Gloss, Wearever Concentrate Wax. Type FTM-3: Everbrite Wax Soap Cleaner, National Chemsearch Concentrate.
Marking: Listee's name and trade name.

National Janitors Supply Co., Detroit 26, Mich.

"Nasco" (FTM-1).
Marking: Listee's name and trade name.

National Laboratories, Inc., Toledo 12, Ohio.

Type FTM-1: Dura-Tex Concentrate Floor Finish, Promenade.
Marking: Listee's name and trade name.

Nelson Co., Walter E., Portland 10, Ore.

"Weneo Liquid Floor Wax," "Weneo Liquid Floor Wax-Safety," "Weneo Liquid Floor Wax-Special" (FTM-1).
Marking: Listee's name and trade name.

Neverub Corp., Chicago 14, Ill.

"Neverub Floor Wax" (FTM-1).
Marking: Listee's name and trade name.

New Jersey Chemical Co., Inc., Lyndhurst, N. J.

Type FTM-1: Jersey, Self-Polishing Floor Wax contains Du Pont's Ludox, Oxford Jel.
Type FTM-3: Oxford.
Marking: Listee's name and trade name.

Newport Products Company Division of Safeway Stores, Incorporated, San Francisco 7, Calif.

Type FTM-1: Waxcraft HN-2000 Heavy Duty Maintenance Wax, Waxcraft Formula [illegible]
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Normco Industries, Inc., Minneapolis 23, Minn.

Type FTM-1: Normco Safety Shine Floor Finish.
Marking: Listee's name and trade name.

Northern Chemical Corp., White Plains, N. Y.

Type FTM-1: Nor-Chem Floor Finish, Nor-Chem Extra Duty Floor Wax.
Marking: Listee's name and trade name.

Northern Sanitary Supply Co., Bridgeport 7, Conn.

Type FTM-1: Nor-Cote. **Type FTM-3:** Nor-San Conditioner and Cleaner, Nor-San Disinfectant Conditioner and Deodorizer, Nor-San DCD Disinfectant-Conditioner-Deodorant.
Marking: Listee's name and trade name.

Northwest Janitor Supply Co., Seattle 4, Wash.

Type FTM-1: Olympic Supreme Self-Polishing Wax, Olympic Supreme Anti-Slip Wax, School Wax, Orthopedic Wax.
Marking: Listee's name and trade name.

Nu-Ball Mfg. Co., Des Moines, Iowa.

Type FTM-1: Nu-Sheen. **Type FTM-2:** Asphalt Tile Sealer, Flex Seal, Inner Seal, Nu-Lite Inner Seal, Nu-Lite Gym Finish, Terrazzo Seal, No-Burn Gym Finish.
Marking: Listee's name and trade name.

Nu-Tone Products Co., Inc., Denver 2, Colo.

Type FTM-1: Floor Fame Coating, Super Film Wax.
Marking: Listee's name and trade name.

O-Cedar, Div. of American-Marietta Co., Chicago 9, Ill.

Type FTM-1: Foot-Note Floor Wax, O-Cedar Foot-Note Floor Finish, O-Cedar Anti-Slip Floor Wax.
Marking: Listee's name and trade name.

Oil-Dri Corp. of America, Chicago 11, Ill.

Type OGA: OIL-DRI, OIL-DRI ALL PURPOSE Absorbent, OIL-DRI Industrial Absorbent.
Marking: Listee's name and trade name.

Oil Specialties & Refining Co., Inc., Brooklyn 1, N. Y.

Type FTM-1: Safite Floor Finish, Saf-T-Wax, Saf-T-Wax No. 120L, Colarene Floor Wax, Machine Method Water Emulsion Paste Wax. **Type FTM-5:** I-CEE Prepared Paste Wax, Saf-T-Wax Prepared Paste Wax.
Marking: Listee's name and trade name.

Omaha Compound Co., Omaha 2, Neb.

Type FTM-1: Defiance.
Marking: Listee's name and trade name.

Opie Brush Co., Kansas City 6, Mo.

"Quickshine" (FTM-1).
Marking: Listee's name and trade name.

Packard Chemical & Equipment Co., Rochester 4, N. Y.

Type FTM-1: Paeco Superior Floor Wax.
Marking: Listee's name and trade name.

Pall Mall Mfg. Co., Long Island City 1, N. Y.

Type FTM-1: Pall Mall, Walter Emulsion Paste Wax, Pall Mall, Liquid Floor Wax with Ludox, No. 108L. **Type FTM-5:** Pall Mall, Slip-Proof Solvent Paste Wax.
Marking: Listee's name and trade name.

Paramount Chemical Co., Columbus, Ga.

"Ace Lustre," "Par-O-Shine Self Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Paramount Sanitary Chemical Co., Wildwood, N. J.

Type FTM-1: Paramount Formula 7 Traffic Wax.
Marking: Listee's name and trade name.

Parker Products Co., Inc., Birmingham, Ala.

Type FTM-1: Parko Xtra-Gloss, Parko Xtra-Grip, Parko Xtra-Hard, Parko Xtra-Tuf.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Patten Co., W. J., Perth Amboy, N. J.

"Nutro-Shine" (FTM-3).
Marking: Listee's name and trade name.

Paulsen & Roles Laboratories, Portland 12, Ore.

Type FTM-1: Mello-Sheen Wax 240, Mello-Sheen Wax 240 Special, Mello-Sheen Wax 305, Mellow-Sheen Wax 305 Special, Mello-Sheen Wax 400, Mello-Sheen Wax 400 Special, Mello-Sheen Wax 418, Mello-Sheen Wax 418 Special, Mello-Sheen Wax 512, Mello-Sheen Wax 512 Special, Mello-Sheen Wax 516, Mello-Sheen Wax 516 Special, Mello-Sheen Wax 518, Mello-Sheen Wax 518 Special, Mello-Sheen Wax Professional, Mello-Sheen Wax Professional Special, Hi-Lo Wax, Hi-Lo Special Floor Wax, Super 16 Double-Tough Heavy-Duty Floor Wax, Super 16 Special Double-Tough Heavy-Duty Floor Wax.
Marking: Listee's name and trade name.

Peck's Products Co., St. Louis 15, Mo.

Type FTM-1: *Pexbrite Wax, Pepcote.* Pexbrite Self Polishing Liquid Wax, Super Gloss Self Polishing Liquid Wax 18%, Pepcote. Type FTM-3: Puraphen Detergent and Germicide.
Marking: Listee's name and trade name.

Peerless Chemical Co., Detroit 4, Mich.

Type FTM-1: Super-Gloss, Peerless Poly-Peerco Floor Lustre.
Marking: Listee's name and trade name.

Peerless Mfg. & Chemical Co., Schuylkill, Pa.

Type FTM-1: Peerless Self-Polishing Liquid Wax.
Marking: Listee's name and trade name.

Perry-Austen Mfg. Co., Staten Island 5, N. Y.

Type FTM-1: Floor Magic.
Marking: Listee's name and trade name.

Pix Co., Inc., Albert, Chicago 8, Ill.

Type FTM-1: Pix-Brite Self-Polishing Liquid Wax, Pix-Brite Self-Polishing Floor Finish.
Marking: Listee's name and trade name.

Pierce & Stevens Chemical Corp., Buffalo 3, N. Y.

Type FTM-1: Keglon Non-Pickup Floor Dressing, Floor Maid, Waxless Brawn Heavy Duty Floor Dressing.
Marking: Listee's name and trade name.

Pioneer Chemical Co., Los Angeles 13, Calif.

Type FTM-3: Pioneer Nu Clean, Pioneer Jet Clean.
Marking: Listee's name and trade name.

Pitt Chemical & Sanitary Supply Co., Pittsburgh 22, Pa.

"Pitt Supreme" (FTM-1).
Marking: Listee's name and trade name.

Plyco Products, Inc., East Boston 28, Mass.

Type FTM-1: Plyco Wax No. 1, Plyco Wax No. 2. Type FTM-3: Plyco Cleaner and Rubber Burn Remover.
Marking: Listee's name and trade name.

Ponsell Floor Products, Inc., New York 11, N. Y.

"Ponsell Industrial Wax Anti-Slip" (FTM-1).
Marking: Listee's name and trade name.

Porters Supply Co., Baltimore 23, Md.

Type FTM-1: Hi-Gleam, Hi-Shine Self-Polishing Wax.
Marking: Listee's name and trade name.

Pratt & Lambert, Inc., Buffalo 7, N. Y.

"Pratt & Lambert Self-Polishing Wax," "'49' Self-Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Preston Distributing Co., Syracuse 6, N. Y.

Type FTM-1: Presto-Gloss No Rubbing Liquid Wax, Presto-Cote Floor Finish. Type FTM-3: Presto-Shine Cleaner.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Pride of the Valley Mills, Inc., Spring Valley, N. Y.

Type OGA: Slip-Knot.
Marking: Listee's name and trade name.

Purex Corp., Ltd., South Gate, Calif.

Type FTM-1: Spotlight Self-Polishing Floor Wax, Brytene Non-Scuff Polymer Floor Polish, Special Anti-Slip Wax. **Type FTM-3:** Big Boss Wax Remover, Clearine All Purpose Liquid Detergent.
Marking: Listee's name and trade name.

Puritan Chemical Co., Atlanta 18, Ga.

Type FTM-1: Aurora, Impervium, Plexin, Bravo, Phenophane, Medalist, and Gloss I.
Marking: Listee's name and trade name.

Puro Co., Inc., The, St. Louis 3, Mo.

Type FTM-1: Deluxe Carnauba Floor Wax, Deluxe Super Heavy Duty Floor Wax, Miracle Carnauba Floor Wax. **Type FTM-3:** Deluxe Heavy Duty Floor Detergent, Deluxe Floor Detergent.
Marking: Listee's name and trade name.

Quality Products Laboratories, Inc., Richmond 23, Va.

"Jiffy Gloss Wax," "QP Wax" (FTM-1).
Marking: Listee's name and trade name.

R. K. Sanitary Supply Co., Inc., Roosevelt, L. I., N. Y.

"Royal Krest Emulsion Paste Wax" (FTM-1).
Marking: Listee's name and trade name.

Ramrod Chemical Co., Chicago 38, Ill.

Type FTM-1: *Safe-T-Glow*, Traction Waxless Floor Finish, Diamond Lustre Floor Finish, *Red Label Wax*, Triumph Waxless Floor Finish.
Marking: Listee's name and trade name.

Reckerd, Farnsworth W., Syracuse 5, N. Y.

Type FTM-1: Reckerd's Heavy Duty Floor Wax, Reckerd's High Gloss Masterpiece Wax, Reckerd's Superior Waterproof Wax, Reckerd's Self Lustre Wax. **Type FTM-3:** Neutra-Shine.
Marking: Listee's name and trade name.

Reily Chemical Co., New Orleans 6, La.

Type FTM-1: Index Wax, Refrax, Andes, Index, 5220, Splendor.
Marking: Listee's name and trade name.

Reissner Chemical Co., Corona 68, L. I., N. Y.

"Floorsaver" (FTM-1).
Marking: Listee's name and trade name.

Reliance Paper Co., Fresno 25, Calif.

Type FTM-1: Repco Emulsion Floor Finish.
Marking: Listee's name and trade name.

Rex Mfg. Co., Inc., Tampa 2, Fla.

"Rex Lustre Self-Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Reyns Supply Co., Inc., The, Newburgh, N. Y.

Type FTM-1: Reco #22 Self Lustre Wax.
Marking: Listee's name and trade name.

Richco Products, Inc., Springfield 3, Mass.

"Richco," "Richco Super," "F.B.Q." (FTM-1).
Marking: Listee's name and trade name.

Richmond Supply Co., Staten Island 4, N. Y.

Type FTM-1: Miracle Mile, Vinyl Cote. **Type FTM-3:** Rich Kleen Conditioner and Cleaner, Staph-Out.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Riddiford Bros., Inc., Chicago 6, Ill.

"Challenger" (FTM-1).
Marking: Listee's name and trade name.

Rochester Germicide Co., Rochester 21, N. Y.

Type FTM-1: Polyself, Heavy Duty Floor Wax, Shield Cote Heavy Duty Floor Polish, Plastall Waxless Floor Polish, Hi-Glo Heavy Duty Floor Polish.
Marking: Listee's name and trade name.

Rose Chemical Products, Inc., Columbus 15, Ohio.

Type FTM-1: White Lustre, Rose Brite Wax, Noxlip. Type FTM-2: *Gym Finish, Lightning Sealer.*
Marking: Listee's name and trade name.

Rubon, Inc., Independence, Mo.

Type FTM-6: Visa-Tret.
Marking: Listee's name and trade name.

Ruether Co., Carl H., Chicago 37, Ill.

"Certain Tred" (FTM-1).
Marking: Listee's name and trade name.

S & S Co., The, Albany, Ga.

Type FTM-1: Sasco Brite, Sasco Wax. Type FTM-3: Sasco 103.
Marking: Listee's name and trade name.

Sabloff's, Liberty, N. Y.

"Sabrolite," "Sabrolite Anti-Skid" (FTM-1).
Marking: Listee's name and trade name.

St. Louis Paint Mfg. Co., St. Louis 4, Mo.

"Panda Gym Seal," (FTM-2).
Marking: Listee's name and trade name.

Sandura Co., Jenkintown, Pa.

Type FTM-1: Sandran Vinyl Floor Dressing.
Marking: Listee's name and trade name.

Sanfax Corp., Atlanta, Ga.

Type FTM-1: San-O-Wax, San-O-Glo, San-O-Gloss, Sano Saf-T-Glo, Sano Saf-T-Gloss, Sanfax KG-99. Type FTM-3: San-O-Brite, Sanfax X-69.
Marking: Listee's name and trade name.

Sanico Chemical Corp., New York 12, N. Y.

Type FTM-1: Sanico Super-Safe Floor Finish.
Marking: Listee's name and trade name.

Sani-Craft Co., Chicago 40, Ill.

"Sani-Craft Wax," "Sani-Craft Heavy Duty Wax" (FTM-1).
Marking: Listee's name and trade name.

Sanitary Supply Co., LaCrosse, Wis.

Type FTM-1: Sansco Heavy Duty Self Polishing Wax, Sansco Heavy Duty Self-Polishing Anti-Slip Wax, Sansco Flor-Shine Self Polishing Wax, Sansco Shur-Grip, Sansco Safe-T-Shine Anti-Slip Floor Coating. Type FTM-3: Sansco All Purpose Cleaner, Sansco D-G Concentrate.
Marking: Listee's name and trade name.

Sanitation Corp., Chicago 19, Ill.

Type FTM-1: Flint Finish, *Sanicor Anti-Slip Carnauba Floor Wax, Sanicor Anti-Slip Carnauba Floor Wax No. 10, Sanicor Flint Finish, Sanicor Hi-Gloss Self-Polishing Wax.* Type FTM-2: *Sanicor Mop-It-On Gym Finish, Sanicor Mop-It-On Penetrating Floor Sealer, Sanicor Terrazzo Sealer.* Type FTM-3: *Sanicor Wax Soap Cleaner, Waxaver.*
Marking: Listee's name and trade name.

Sanitek Products, Inc., Los Angeles 39, Calif.

Type FTM-1: Tuff Sheen Wax, Stop Floor Finish. Type FTM-2: Sani-Flex. Type FTM-3: Sanover.
Marking: Listees' name and trade name.

San Joaquin Paper & Janitor Supply Co., Fresno, Calif.

Type FTM-1: Public Quality Wax, Premium Public Quality Wax.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Savin Products Co., Boston 25, Mass.

Type FTM-1: Flor-Mate.
Marking: Listee's name and trade name.

Schmitt Distributors, Inc., Hewlett, N. Y.

Type OGA: Drizoil.
Marking: Listee's name and trade name.

Schneid, Inc., I., Atlanta 18, Ga.

Type FTM-1: Luster Gloss, Luster Gloss Heavy Duty, Glo-Dox, Self-Polishing FW 151-A, Waterproof Heavy Duty Floor Wax, Gleam.
Marking: Listee's name and trade name.

Science Industries, Inc., St. Louis 2, Mo.

Type FTM-1: High-Carnauba Floor Wax, Supreme Heavy Duty Floor Finish, Supreme Carnauba Floor Wax, Safe-Tred Self Polishing Wax. Type FTM-3: Supreme Floor Wax Stripper, Three Way Floor Detergent.
Marking: Listee's name and trade name.

Scientific Supply Co., Inc., Denver 1, Colo.

Type FTM-1: Grip Wax, Mirro Brite, Grip Wax-18%, No-Wax.
Marking: Listee's name and trade name.

Scientific Wax Products Corp., Terre Haute, Ind.

Type FTM-1: Jay's Safety Wax.
Marking: Listee's name and trade name.

Scotchway Wax Products Co., Berkeley 10, Calif.

Type FTM-1: Scotchway Dressing. Type FTM-3: Scotchway Cleaner.
Marking: Listee's name and trade name.

Sears, Roebuck & Co., Chicago 7, Ill.

Type FTM-1: *Maid-of-Honor Standard No Rubbing Floor Wax*, Searsafe Composition Floor Dressing. Type FTM-2: *Master-Mixed Asphalt Tile Sealer and Finish.*
Marking: Listee's name and trade name.

Sea-Tac Products, Inc., Seattle 7, Wash.

Type FTM-1: Sea-Tac Super Floor Finish.
Marking: Listee's name and trade name.

Selig Co., The, Atlanta 1, Ga.

"Rapi-Dry," "O-Brite-O," "O-Brite-O Twenty" (FTM-1).
Marking: Listee's name and trade name.

Service Supply Co., Inc., New York 13, N. Y.

Type FTM-1: Roma Self Polishing Floor Wax.
Marking: Listee's name and trade name.

Sexton & Co., John, Chicago 90, Ill.

Type FTM-1: Sexton Waxol, Sexton Safety.
Marking: Listee's name and trade name.

Shelly-Andrews Co., The, Chicago 40, Ill.

Type FTM-1: Industrial Wax, Sure Foot Wax, Industrial Sure Foot Wax, Industrial No-Wax, No-Wax.
Marking: Listee's name and trade name.

Sherwin-Williams Co., The, Cleveland 1, Ohio.

Type FTM-1: Building Maintenance Antislip Floor Wax W90TC7, Sherwin-Williams Industrial Maintenance Self-Polishing Wax B66T1.
Marking: Listee's name and trade name.

Shetland Co., Inc., The, Lynn, Mass.

"Electrowax" (FTM-1).
Marking: Listee's name and trade name.

Shipco, Inc., Des Moines 15, Iowa.

Type FTM-1: Firm Grip, Long Wear, Super Wax, Supreme Wax.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Shuler Co., R. E., Memphis 7, Tenn.

Type FTM-1: Satin Glo. Type FTM-3: Resco Cleaning Concentrate.
Marking: Listee's name and trade name.

Simoniz Co., Chicago 16, Ill.

Type FTM-1: Simoniz Non-Scuff Floor Wax, Simoniz Commercial Heavy Duty Floor Wax, Simoniz Commercial Non Scuff Slip Resistant Floor Wax, Simoniz Commercial Super Anti-Slip Heavy Duty Safety Floor Wax. Type FTM-3: Simoniz Commercial All Purpose (Concentrate) Floor Cleaner. Type FTM-5: Commercial Simoniz Triple A Paste Floor Wax.
Marking: Listee's name and trade name.

Smith Co., H. V., St. Paul 4, Minn.

Type FTM-1: Stanzol No. 70, Stanzol D Floor Wax, Stanzol E Floor Wax, Stanzol Grip-Gloss, Stanzol Safe-T-Glo.
Marking: Listee's name and trade name.

Soakup Corp., The, Grand Rapids 2, Mich.

"Soakup" (OGA).
Marking: Listee's name and trade name.

Solarine Co., The, Baltimore 24, Md.

"Solarine Prime Carnauba Floor Wax" (FTM-1).
Marking: Listee's name and trade name.

Southern California Disinfecting Co., Los Angeles 65, Calif.

Type FTM-1: Glow 12, Glow 18, Vin-L, Super Lustre, Super Lustre Regular, Dri Lustre, Dri Lustre Regular, Vyn-X 24, Lifeguard "A." Type FTM-3: Fast, EZ Clean, Special Stripper, So-Cal Strip X, Spray-Off, So-Cal 6.
Marking: Listee's name and trade name.

Southern Chemical Co., Charleston, W. Va.

Type FTM-1: Sano-Gloss.
Marking: Listee's name and trade name.

Southern Chemical Products Co., Macon, Ga.

Type FTM-1: Safe Wax, Southern Self Polishing Wax, Heavy Duty Wax, Super Duty Wax, Waterproof Wax-12, Waterproof Wax-15, Waterproof Wax-18, Floor Finish-12, Floor Finish-15, Floor Finish-18, Self Polishing Wax-151, No. 500 Wax.
Marking: Listee's name and trade name.

Southern Clay Co., Inc., Paris, Tenn.

"Oil-Zorb"—(OGA).
Marking: Listee's name and trade name.

Southern Products Co., Inc., Chattanooga 2, Tenn.

Type FTM-1: Southern Lustre Wax, Southern Lustre Anti-Slip Wax, Southern Lustre Water Resistant.
Marking: Listee's name and trade name.

Southern Sanitary Co., Inc., Norfolk 10, Va.

Type FTM-1: So-San-Co White Label, So-San-Co White Label Floor Finish. Type FTM-3: So-San-Co White Label Cleaner.
Marking: Listee's name and trade name.

Spurrier Paper Co., Wichita, Kan.

Type FTM-1: Spur-Tex Safety Floor Finish AS-5, Spur-Tex Supreme Heavy Duty Wax AW-1, *Heavy Duty Wax AW-3, Supreme Safety Floor Finish AS-2.*
Marking: Listee's name and trade name.

Stalfort & Sons, Inc., John C., Baltimore 1, Md.

Type FTM-1: Stalfort's Heavy Duty Maintenance Wax-Regulator, Stalfort's Heavy Duty Maintenance Wax-Antislip, Self-Shining Floor Wax, Utility Creme, Special Water Emulsion Paste Wax, Stalfort's Co-Polymer Self Polishing Wax, Self-Shining Hard Non-Scuff Wax. Type FTM-5: Liquid Buffing Wax.
Marking: Listee's name and trade name.

Staminite Corp., The, New Haven 11, Conn.

"Heavy Duty Green Label Wax," "Staminite Safe-T-Tred Wax" (FTM-1); "Staminite Wax Soap Cleaner" (FTM-3).
Marking: Listee's name and trade name.

FED CLOSE TO EDGE

Floor Coating and Finishing Material—*Continued*

Standard Oil Company of California, San Francisco 20, Calif.

Type FTM-1: Chevron Wax Glo.
Marking: Listee's name and trade name.

Stanley Home Products, Inc., Easthampton, Mass.

Type FTM-1: Stanley Heavy-Duty Floor Wax Water Emulsion Formula 34, Stanley Water Emulsion Wax Formula 12, Stanley Water Emulsion Wax, Stanley Floor Protector Formula 91, Stanley Heavy-Duty Floor Wax Water Emulsion Formula 37 14% Solid Content No. 91210A (SF-36-72A), Stanley Heavy-Duty Floor Wax with No. 1 Carnauba.
Marking: Listee's name and trade name.

Staples & Co., Inc., H. F., Medford, Mass.

Type FTM-1: Staples Anti-Slip Floor Wax. Type FTM-5: Staples Liquid Bowling Alley Wax.
Marking: Listee's name and trade name.

State Chemical Mfg. Co., The, Cleveland 14, Ohio.

Type FTM-1: *Super Safe-T-Kote*, Green Cross Safety Finish, Sta-Kote (Formula 180). Type FTM-3: Super Eight-80D Concentrate.
Marking: Listee's name and trade name.

Stein Paint & Glass Co., Moorhead, Minn.

Type FTM-1: Industrial Heavy Wax.
Marking: Listee's name and trade name.

Sterling Sanitary Supply Corp., New York 12, N. Y.

"STEP Sure FLOOR FINISH," "Sterling Heavy Duty Wax" (FTM-1).
Marking: Listee's name and trade name.

Stetson Co., M. D., Boston 18, Mass.

Type FTM-1: Glossene, Flortone, Florbrite, Reflex B.
Marking: Listee's name and trade name.

Stevens Chemical Co., Chicago 26, Ill.

Type FTM-1: Sta-Brite, Stevolite, Sta-Shine.
Marking: Listee's name and trade name.

Stoltz Chemical Co., Stockton 14, Calif.

"Hospital Grade Wax," "Cota-Coat Wax," "Self Polishing Wax" (FTM-1).
Marking: Listee's name and trade name.

Superior Chemical Co., Houston 1, Texas.

Type FTM-1: Self Polishing Liquid Wax SHD, Self Polishing Liquid Wax SHD-18, Self Polishing Anti Slip Liquid Wax SHD, Super-Cote Floor Coating. Type FTM-3: Cleanrite, Superior Super-Syn Cleaner. Type FTM-5: Superior Supershine Pigment Polishing Wax -Red, -Green, or -Black, Supershine Polishing Wax.
Marking: Listee's name and trade name.

Superior Chemical Products Co., Youngstown 3, Ohio.

Type FTM-1: Duxbak Wax.
Marking: Listee's name and trade name.

Supreme Chemical Co., Chicago 22, Ill.

"Super Gloss Wax," "Anti-Slip Super Gloss Wax" (FTM-1).
Marking: Listee's name and trade name.

Supreme Products Co., Memphis, Tenn.

"Supreme Liquid Wax" (FTM-1).
Marking: Listee's name and trade name.

Taylor Supply Co., Inc., Nashville 4, Tenn.

Type FTM-1: Tasco Deep Luster Waterproof Wax.
Marking: Listee's name and trade name.

Technical Maintenance Products, Inc., Philadelphia 33, Pa.

Type FTM-1: Super See Deck, Sure Brite. Type FTM-2: Seel-All.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Tech Soap Mfg. Co., Chicago 19, Ill.

"Tech Slip Resistant Floor Wax," "Tech Supreme Self-Polishing WAX," "Tech Supreme Antislip Wax" (FTM-1); "Wax-O-Lite" (FTM-3).
Marking: Listee's name and trade name.

Tennant Co., G. H., Minneapolis 22, Minn.

Type FTM-1: *Tennant Self-Polishing Wax.* Type FTM-5: Tennant Wax Bar.
Marking: Listee's name and trade name.

Tested Products Co., Los Angeles 1, Calif.

Type FTM-3: Spray or Mop Neutral Cleaner. Type FTM-6: Dust Control.
Marking: Listee's name and trade name.

Texize Chemicals, Inc., Greenville, S. C.

Type FTM-1: Texize 888, Texize 886, Texize 890, Texize 892.
Marking: Listee's name and trade name.

Texo Corp., Cincinnati 7, Ohio.

Type FTM-1: *Texobrite #1, Texobrite #2,* Super Lustretex.
Marking: Listee's name and trade name.

Textilana Corp., Hawthorne, Calif.

Type FTM-1: Ultra Gloss Heavy-Duty Self-Polishing Wax, 820-12, JO, No Rubbing Wax JT, Ultra Gloss 400 Industrial Floor Wax, No Rubbing Floor Wax Formula AS, Formula SV-12. Type FTM-3: Cleaner S, Cleaner SW.
Marking: Listee's name and trade name.

Thur-O Waxing Service, Chicago 40, Ill.

Type FTM-1: Thur-O Floor Finish. Type FTM-3: Thur-O Ammoniated Wax Remover, Thur-O Liquid Detergent.
Marking: Listee's name and trade name.

Tile-Tex Div., The Flintkote Co., New York 20, N. Y.

Type FTM-1: Tile-Tex Floor Finish.
Marking: Listee's name and trade name.

Times Maintenance Co., Chicago 18, Ill.

Type FTM-1: Time-4-Wax, Special Gloss Wax, Water Resistant Wax.
Marking: Listee's name and trade name.

Tontine Shops, Inc., Buffalo 3, N. Y.

"Tonee Self-Polishing Floor Wax" (FTM-1); "Tonee Concentrated Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Top Products Co., New Haven 11, Conn.

Type FTM-1: No Rubbing Floor Wax, Top Royal Finish.
Marking: Listee's name and trade name.

Trade Supply Co., Alexandria, Va.

"Traco Heavy Duty Industrial Wax" (FTM-1); "Traco Floor Conditioner and Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Tremco Mfg. Co., The, Cleveland 4, Ohio.

Type FTM-1: Tremwax. Type FTM-2: Penetrem, Penetrem Gym Finish, Tremseal, Tremseal 20. Type FTM-3: Penetrem Cleaner.
Marking: Listee's name and trade name.

Trewax Co., Culver City, Calif.

Type FTM-1: Trewax Self Polishing Gold Label, Trewax Non-Slip Liquid Floor Wax. Type FTM-5: Clear Trewax, Trewax Liquid Cleaning and Polishing Wax, Trewax (Red), Indian Sand Trewax.
Marking: Listee's name and trade name.

Trio Chemical Works, Inc., Brooklyn 6, N. Y.

"Cara-O-Shyne," "52 W," "Emulsion Paste Wax," and "Amazon Germicidal Nonrubbing Floor Wax" (FTM-1); "Mop Treatment Compound" (FTM-6).
Marking: Listee's name and trade name.

Tri-State Sanitation Co., Inc., Buffalo 3, N. Y.

Type FTM-1: Glo-Brite Self-Polishing Wax, Slip-Stop R. Type FTM-3: Lo-PH Conditioner and Cleaner.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Tropical Paint Co., Cleveland 2, Ohio.

Type FTM-1: Lusteron.
Marking: Listee's name and trade name.

Troy Industrial Products, Div. of Globe Sanitary Supply Co., Los Angeles 58, Calif.

"176AS Troy Hi-Lustre Anti-Slip Wax," "176W Troy Hi-Lustre Wax" (FTM-1).
Marking: Listee's name and trade name.

Tulsa Sanitary Supply, Tulsa 5, Okla.

Type FTM-1: Sani Sheen, Super Sani Sheen, Premium Sani Sheen.
Marking: Listee's name and trade name.

Tumbler Laboratories, Inc., J. A., Baltimore 1, Md.

Type FTM-1: Sliproof Liquid Floor Wax, Jat Gloss Self-Polishing Floor Wax, Sled-Tred Wax, Tuf-Tex.
Marking: Listee's name and trade name.

Turco Products, Inc., Wilmington, Calif.

Type FTM-1: Turco Poly Gleem.
Marking: Listee's name and trade name.

Turner-Brooks, Inc., Detroit 6, Mich.

"Grip-Tread," "Protect-O-Sheen" (FTM-1).
Marking: Listee's name and trade name.

Twi-Laq Chemical Co., Brooklyn 5, N. Y.

Type FTM-1: Super 70 Wax, Superkote, Haddon Hall S.C.M.
Marking: Listee's name and trade name.

Twin City Janitor Supply, St. Paul 6, Minn.

Type FTM-1: Beaver Anti-Slip Floor Coating.
Marking: Listee's name and trade name.

Twin City Shellac Co., Inc., Brooklyn 5, N. Y.

Type FTM-1: No. 340 Non-Skid No Rubbing Floor Wax, Dan-Dee Self-Polishing Floor Wax, Dan-Dee New Hard Lustre Floor Wax. **Type FTM-5:** Dan-Dee No-Slipping Floor Polish.
Marking: Listee's name and trade name.

Uncle Sam Chemical Co., Inc., New York 27, N. Y.

Type FTM-1: Satin Gloss No-Rubbing Floor Wax, Heavy-Duty No-Rubbing Floor Wax, Super Gloss No-Rubbing Floor Wax, Non-Skuff Floor Wax, USCO Evertuff Safety Floor Finish, Water Emulsion Paste Wax, Kleer-Brite Safety Floor Finish, and Radiant Jell.
Marking: Listee's name and trade name.

United Chemical Co., Inc., Kansas City 5, Mo.

Type FTM-1: Klere-Sheen, SunneSheen, SuperSheen, U-C Anti-Slip Wax.
Marking: Listee's name and trade name.

United States Ceramic Tile Co., Canton 2, Ohio.

Type FTM-1: Ceramaflex Sealer.
Marking: Listee's name and trade name.

United States Chemical Corp., New Haven, Conn.

Type FTM-1: Safe Glow.
Marking: Listee's name and trade name.

U. S. Paint Lacquer & Chemical Co., St. Louis 3, Mo.

Type FTM-2: Plastaloid Transparent Finish No. 335.
Marking: Listee's name and trade name.

U. S. Polychemical Corp., New York 36, N. Y.

Type FTM-1: U. S. Poly-Sheen #312. **Type FTM-2:** U. S. Poly-Cote #301, U. S. Poly Terracote #309, U. S. Poly Krette-Kote #308.
Marking: Listee's name and trade name.

U. S. Sanitary Specialties Corp., Chicago 12, Ill.

Type FTM-1: Luster-Bryte, Luster-Bryte XX, Glo, Challenge NRX Wax, Challenge NR1 Wax, Challenge NR2 Wax, Varee-Bryte XX, Flourish, Flattery. **Type FTM-1:** *Mastiseal, Preserva-Seal, Quick Preserva-Seal, Trazo-Seal, Tufen-Bryte, Quick Tufen-Bryte, Litho-Seal for Concrete Floors.*
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

Universal Chemical Co., The, Div. of Hadco Corp., Cleveland 13, Ohio.

Type FTM-1: Uniglo.
Marking: Listee's name and trade name.

Universal Research Corp., Philadelphia 3, Pa.

Type FTM-1: Foam-Brite.
Marking: Listee's name and trade name.

Utility Chemical Co., Paterson 4, N. J.

Type FTM-1: Utiglo Floor Finish.
Marking: Listee's name and trade name.

Valley Soap & Chemical Co., Hanford, Calif.

Type FTM-1: Vas Wax.
Marking: Listee's name and trade name.

Varley & Sons, Inc., James, St. Louis 15, Mo.

Type FTM-3: Creme-Cote.
Marking: Listee's name and trade name.

Vasco Products Co., Elmira, N. Y.

Type FTM-1: Vasco Double Duty Wax, Vasco Extra Heavy Duty Wax. Type FTM-3: Vasco Lemon Cleaner.
Marking: Listee's name and trade name.

Venus Chemical Co., Inc., New York 17, N. Y.

Type FTM-1: Venus Floor Polish.
Marking: Listee's name and trade name.

Vestal Laboratories, Inc., St. Louis 10, Mo.

Type FTM-1: Vesta Gloss SR, Vesta-Gloss, Vestal-18, Vestal-100, Vestal-S100, Vesta-Cote, Vestal-500, Vestal Style, Tell Tale Style. Type FTM-2: Vestal Sealer No. 5. Type FTM-5: Pyra-Cote.
Marking: Listee's name and trade name.

Viking Resin Products, Inc., Waverly, N. Y.

Type FTM-2: Viking RS-100, Viking E-505 Hi-Gloss Seal Coater, Viking RS-400 Tile Sealer.
Marking: Listee's name and trade name

Virginia Greenstone Co., Inc., Lynchburg, Va.

"Virginia Greenstone," (WCM-1).
Marking: Listee's name and trade name

Wade, Wenger & Associates, Inc., Chicago 14, Ill.

Type FTM-1: Servicemaster Floorstar Buffable Wax Floor Finish, Servicemaster Floorstar Semi-Buffable Floor Finish, Servicemaster Floorstar Nonbuffable Floor Finish.
Marking: Listee's name and trade name.

Waldike Co., The, Brooklyn 38, N. Y.

Type FTM-1: Machine Method Water Emulsion Paste Wax by Waldike. Type FTM-5: Prepared Paste Wax by Waldike.
Marking: Listee's name and trade name.

Wasatch Chemical Co., Salt Lake City 6, Utah.

Type FTM-1: Duragloss, Heavy Duty Traffic Wax.
Marking: Listee's name and trade name.

Washburn Co., T. F., Chicago 14, Ill.

Type FTM-1: Lock-Step Protective Coating, No. 3883, No. 4025, Sure-Step 12-14-18, 3838 Protective Coating, Deep Luster Wax No. 12-14-18, Celafon Floor Coating 12, Celafon Floor Coating 15, Marvax Floor Treatment, Anti-Slip Emulsion Wax, No. 3954, Mirafon. Type FTM-2: All American Gym Finish, All-Star Gym Finish, Penetrating Seal, Florco Seal, Gymperial Finish, Penacron Seal. Type FTM-3: Deep Tone, Poly-Duty Cleaner Wax, Synturge. Type FTM-5: Florfilm.
Marking: Listee's name and trade name.

Waverly Petroleum Products Co., Philadelphia 4, Pa.

Type OGA: Hi-Dri, Dri-Zit, Petro-Sorb.
Marking: Listee's name and trade name.

Weiner & Sons, Leo E., Monticello, N. Y.

Type FTM-1: Lew's Institutional Liquid Wax.
Marking: Listee's name and trade name.

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Floor Coating and Finishing Material—*Continued*

West Chemical Products, Inc., West Disinfecting Div., Long Island City 1, N. Y.

Type FTM-1: Kwykwax, Westwax, Super Westwax, Tredcote, West Durable Wax, West Slip-Resistant Finish, Westbryte. **Type FTM-2:** *Lastincote, Lastincote No. 7, West Mastic (Asphalt) Tile Finish.* **Type FTM-6:** Westone, Super Westone.
Marking: Listee's name and trade name.

Western Chemical Co., San Francisco 10, Calif.

Type FTM-1: Mayfair Safety Tread, Mayfair Luster Wax, Mayfair Luster Wax, Formula 'B.'
Marking: Listee's name and trade name.

Western Chemical Co., St. Joseph, Mo.

Type FTM-1: *Flozon, Chez Slip Wax.* **Type FTM-2:** Triumph Wood Seal, Triumph Gymnasium Finish.
Marking: Listee's name and trade name.

Western Laboratories, Inc., El Monte, Calif.

Type FTM-1: HCL Liquid Floor Wax.
Marking: Listee's name and trade name.

Wetherill & Co., Inc., Geo. D., Philadelphia 6, Pa.

"Wetherill's 4R Self-Polishing Wax," "Wetherill's 4R Heavy Duty Self-Polishing Wax" (FTM-1); "Wetherill's 4R Floor and Paint Cleaner" (FTM-3).
Marking: Listee's name and trade name.

Whistlclean Corp., The, New York 16, N. Y.

Type FTM-1: Whistlwax Heavy Duty Slip Resistant Floor Wax, Whistl-Phane Liquid Floor Finish.
Marking: Listee's name and trade name.

Wilbert Products Co., Inc., New York 54, N. Y.

Type FTM-5: Wilbert Paste Wax.
Marking: Listee's name and trade name.

Willis Supply Co., Duluth 2, Minn.

Type FTM-1: Poly-Gard Protective Floor Coating.
Marking: Listee's name and trade name.

Windsor Wax Co., Inc., Hoboken, N. J.

Type FTM-1: Nos. 112, 124, 135X, 140, 144, 144X followed by "No Rubbing Wax"; Kare 33, Nos. 88, 126, 129, 135; Wincoat No. 236, Wincoat No. 315, Wincoat 316, Win-Tone, Winsome, #148 Hospital Safe, #142 School Traffic, Win-Buff Buffable Floor Finish, Pro-Plastic, Wingard. **Type FTM-5:** Windsor Pigment Wax. **Type FTM-6:** Win-Trol.
Marking: Listee's name and trade name.

Woodbury Chemical Co., St. Joseph, Mo.

Type FTM-3: White House Superior Cleaner & Conditioner.
Marking: Listee's name and trade name.

Wood Steel Co., Alan, Conshohocken, Pa.

"AW Algrip Abrasive Rolled Steel Floor Plate" (WCM-3).
Marking: Listee's name, trade name and the thickness of the plate on a label at the back of the plate.

Worrell-Consolidated Laboratories, Inc., St. Louis 10, Mo.

Type FTM-1: Skidproof, Dura-Gloss, Safe-Gloss, Economo.
Marking: Listee's name and trade name.

Wright Floor Products Co., San Antonio 1, Texas.

Type FTM-1: Rite-Lustre, Rite-Brite.
Marking: Listee's name and trade name.

Wyandotte Chemicals Corp., Wyandotte, Mich.

Type FTM-1: Wyandotte Raltec. **Type OGA:** Wyandotte Zorball.
Marking: Listee's name and trade name.

Zep Mfg. Corp., Atlanta 1, Ga.

Type FTM-1: Zep Lustre Safety Wax, Zepreme, Zeprotex Waxless Floor Finish, Zep-O-Tred 20, Zephyr-88.
Marking: Listee's name and trade name.

COPY PRINTE

GAS APPLIANCES

BLOWPIPES AND TORCHES (40 L12)

LOOK FOR THE LABEL

Blowpipes or torches are intended for oxy-acetylene welding and cutting operations. They are designed to utilize acetylene at pressure not over 15 psi from low- or medium-pressure acetylene generators or stored in high-pressure acetylene cylinders employing suitable pressure-reducing valves.

Blowpipes or torches are listed under the Label Service of Underwriters' Laboratories, Inc. The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service program. Inspections and tests at the factory include countercheck of design, construction, and materials. Completed assemblies are tested for leakage at joints between parts subjected to gas pressure during use.

Label Service

Air Reduction Co., Inc., New York 17, N. Y.
Welding and cutting.

Bastian-Blessing Co., The, Chicago 30, Ill.
Welding and cutting.

Craftsweld Equipment Corp., Long Island City 1, N. Y.
Welding and cutting.

Dockson Corp., Detroit 8, Mich.
Welding and cutting.

General Dynamics Corp., Liquid Carbonic Div., Chicago 3, Ill.
Welding, cutting, and cutting attachments.

Hammon Precision Equipment Co., Oakland 21, Calif.
Welding and cutting.

Harris Calorific Co., The, Cleveland 2, Ohio.
Welding, cutting, and cutting attachments.

Industrial Gas & Welding Laboratories, Schenectady 6, N. Y.
Welding and cutting.

K-G Equipment Co., Inc., The, Allentown, Pa.
Welding, cutting, and cutting attachments.

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.
Welding, cutting, and cutting attachments.

Marquette Manufacturing Co., Div. of Marquette Corp., Minneapolis 14, Minn.
Welding, cutting, and cutting attachments.

Modern Engineering Co., St. Louis, Mo.
Welding and cutting.

Montgomery Ward & Co., Inc., Chicago 7, Ill.
Welding, cutting, and cutting attachments.

National Cylinder Gas Div. of Chemetron Corp., Chicago 11, Ill.
Welding, cutting, and cutting attachments.

National Welding Equipment Co., San Francisco 5, Calif.
Welding, cutting, and cutting attachments.

S-S Co., Brooklyn 22, N. Y.
Welding.

Sears, Roebuck & Co., Chicago 7, Ill.
Welding and cutting.

NTED CLOSE TO EDGE

Gas Appliances—Blowpipes and Torches—*Continued*

Tescom Corp., Smith Welding Equipment Div., Minneapolis 14, Minn.

Welding, cutting, and cutting attachments.

Victor Equipment Co., San Francisco 7, Calif.

Welding, cutting, and cutting attachments.

Weldit, Inc., Detroit 6, Mich.

Welding and cutting attachments.

BLOWPIPES, METAL-SPRAYING (40 L13)

Metal-spraying blowpipes operated by oxygen, acetylene, and compressed air, used for spraying metals for protective and other forms of coating.
Note: Users should take precautions to guard against breathing hazardous fumes when using these devices in spaces without adequate ventilation.
These devices are listed under Reexamination Service of Underwriters' Laboratories, Inc.

Reexamination Service

Kennametal, Inc., Latrobe, Pa.

Model 22.
Marking: Listee's name and model designation.

METCO, Inc., Westbury, L. I., N. Y.

Types E, L, P, Y, 2E, 2P, 3E, 4E, 5E.
Marking: Listee's name and type designation.

Wall Colmonoy Corp., Detroit 3, Mich.

Models C2, D Spraywelder.
Marking: Listee's name and model designation.

FLUX DISPENSERS (540 I0)

Reexamination Service

Gasflux Co., The, Elyria, Ohio.

Flux dispensers, Models R, S, 69 and 86 with or without one or more of the following suffix letters E, F, and H. For use with Listee's "Gasflux" liquid flux.
Marking: Listee's name and model designation.

Rexarc, Incorporated, West Alexandria, Ohio.

Flux dispensers, Models "Junior," "Ace," "Master," 16, 16L, 17, 17L, 18, 18L.
Marking: Listee's name and model designation.

GAUGES FOR COMPRESSED GAS (140 A1)

Bourdon tube gauges for use in connection with apparatus using gases under high pressure, including oxygen, hydrogen, acetylene, and other hydro-carbon gases, nitrous oxide and other gases which do not seriously affect materials of gauges.
Gauge cases designed to prevent throwing glass into faces of workmen reading gauge when spring tubes fail.

Reexamination Service

Airco Equipment Mfg. Div., Air Reduction Co., Inc., Union, N. J.

Models 847 and 847A in 2½-in. size for use with oxygen, hydrogen, acetylene, other hydrocarbon gases, nitrous oxide.
Marking: Listee's name and model designation.

Air Reduction Co., Inc., New York 17, N. Y.

"Solfrunt, 667 and 667-A" and Types BU-2581-AB, -AD, -AE, -AF, -AH, -AI, -AJ, -AK, -AL, -AM, -AN, -AO, -AP, -AQ, -AR, -AS, -AU, and -AY in sizes 1½, 2, 2½, 3, and 3½ with argon, helium, hydrogen, nitrogen, nitrous oxide and oxygen. Type BU-2581-AV in size 2 in. for use with carbon dioxide.
Marking: "Airco" and type designation.

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

Models 847 and 847-A in 1½-, 2-, and 2½-in. sizes for use with argon, helium, hydrogen, nitrogen, nitrous oxide, and oxygen. Type 26-Y-98 in size 2 in. for use with carbon dioxide.
Marking: Trade-mark "Oxweld," "Prest-O-Weld," "Purox," "Linde," and model designation.

Manometer-Fabrik Max Preiss, Beuel-Bonn a. Rh., Germany.

Type 8701 for use with oxygen.
Marking: EMPEO and type designation.

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Gas Appliances—Gauges for Compressed Gas—*Continued*

Marshalltown Mfg. Co., Marshalltown, Iowa.

Models 767A, -B for use with oxygen, hydrogen, carbon dioxide.
Marking: Listee's name and model designation.

Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.

Models "847" and "847-A" in 1½-, 2-, and 2½-in. sizes for use with argon, helium, hydrogen, nitrogen, nitrous oxide, and oxygen. Models "848-A" in 2½-in., "848-B," "848-E" in 2-in., add "848-C" in 1½-in. sizes for use with carbon dioxide.
Marking: Listee's name and model designation.

United States Gauge, Div. of American Machine & Metals, Inc., Sellersville, Pa.

"Bolfrunt, 667 and 667-A" and Types BU-2581-AB, -AD, -AE, -AF, -AH, -AI, -AJ, -AK, -AL, -AM, -AN, -AO, -AP, -AQ, -AR, -AS, -AU, and -AY in sizes 1½-, 2-, 2½-, 3-, and 3½-in. with argon, helium, hydrogen, nitrogen, nitrous oxide and oxygen. Type BU-2581-AV in size 2 in. for use with carbon dioxide.
Marking: Listee's name and type designation on dial.

HOSE COUPLERS (540 I0)

Reexamination Service

Hansen Mfg. Co., The, Cleveland 11, Ohio.

"Hansen" oxygen and acetylene hose couplers designed for use with oxy-acetylene welding and cutting apparatus. Series 600 and 700.
Oxygen and nitrous oxide hose couplers, designed for use in hospitals for distribution of oxygen and nitrous oxide in rigid piping at pressures not exceeding 100 psig. Series 600X and 700NX.
Marking: Listee's name, address, and model number stamped on socket.

Schrader's Son, A., Div. Scovill Mfg. Co., Incorporated, Brooklyn 17, N. Y.

"Schrader" hose couplings for use in systems distributing oxygen and nitrous oxide in hospitals in rigid piping at pressures not over 70 psig.

	Couplers Cat. Nos.	Adapters Cat. Nos.
Oxygen	4800	4927
	4810	4957
	4951	
Nitrous Oxide	4823	4934

Marking: Listee's name "Schrader" and catalog designation stamped on body.

STATION TERMINAL, OXYGEN (540 I0)

Reexamination Service

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

Types S-1, -2, -3, -5, -6.
Marking: Trade-mark "Oxweld" and type designation.

TRUCKS FOR HIGH-PRESSURE CYLINDERS (400 R0)

Reexamination Service

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

Hand trucks, Types T-2, -6, -9, -10, -11 for conveying high-pressure gas cylinders containing oxygen, hydrogen, acetylene, etc., provided with means for holding cylinders in place.
Marking: Trade-mark "Oxweld" and type designation.

VALVES—EARTHQUAKE, GAS SHUT-OFF (540 I0)

Reexamination Service

McRae Specialty Co., Don, Glendale 6, Calif.

Made in 1-, 1¼-, 1½-, 2-, 2½-, 3-, 4-, 6-, and 8-in. sizes.
Marking: Listee's name and model designation.

NTED CLOSE TO EDGE

Gas Appliances—*Continued*

VALVES, REDUCING (440 A1)

Reexamination Service

Air Reduction Co., Inc., New York 17, N. Y.

For use with acetylene, Series 0100, 0200, 0400, 0500, 0800, 0900, 1100, 8200, 8300, 8500, 8800; Stock Nos. 805-0402, -1802, -1952, -2802, -8912, -9412, 806-0004, -0007, -0012, -8002, -8009, -8012, -8022, -8052, -8059, -8062, -8072, -8102, -8109, -8402, -8419, -8772, -8902, -8942, -8952, -8954, -9462, -9469, -9912, -9952, -9954. **For use with air,** Stock Nos. 805-8066, 806-8053, -8063, -8073, -8957, -8958, -9957, -9958. **For use with argon,** Stock Nos. 806-8024, -8034, -8044, -8054, -8064, -8074, -8117, -8127, -8437, -8447, -8474, -8961, -9407, -9414, -9464, -9474, -9961. **For use with carbon dioxide,** Stock Nos. 805-8066, -8085, 806-8015, -8025, -8035, -8045, -8055, -8065-1, -8065-2, -8115, -8125, -8435, -9975. **For use with ethylene,** Stock Nos. 805-8066, -8088. **For use with helium,** Stock Nos. 805-8066, -8088, 806-8053, -8063, -8070, -8073, -8138, -8418, -8425, -8470, -8418, -8942, -8953, -9433, -9434, -9443, -9444, -9953. **For use with hydrogen,** Stock Nos. 805-8423, 806-8103, -8403, -8413, -8414, -8433, **For use with liquefied petroleum gases,** Stock Nos. 806-8132, -8462, -8942, -8942. **For use with natural and manufactured gases,** Series 8500; Stock Nos. 806-8942, -9942. **For use with nitrogen,** Stock Nos. 805-8415, -8420, -8429, -8430, -8449, 806-8105, -8121, -8122, -8124, -8420, -8424, -8427, -8433, -8439, -8957, -8964, -8984, -9402, -9403, -9964. **For use with nitrous oxide,** Stock Nos. 805-8066, -8088, -8110. **For use with oxygen,** Series 0100, 0200, 0400, 0500, 0800, 0900, 1100, 8200, 8300, 8400, 8500; Stock Nos. 805-0401, -0456, -0481, -1806, -1950, -1951, -2801, -2806, -2950, -2951, -8066, -8076, -8077, -8078, -8084, -8086, -8087, -8088, -8089, -8110, -8477, -8479, -8485, -8486, -8488, -9410, -9411, -9416, -9421, -9486, -9498, -9997, 806-0004, -0011, -8001, -8006, -8056, -8100, -8101, -8106, -8401, -8411, -8451, -8456, -8466, -8481, -8482, -8771, -8900, -8901, -8950, -8951, -8963, -8981, -8990, -8991, -8431, -9461, -9466, -9950, -9951, -9990, -9991; Nos. 10, 50, 50 Flowmaster. Pilot regulators, Stock Nos. 806-0013, -8067, -8068, -8069, -8999.

Marking: "Airco" and number or series designation.

Bastian-Blessing Co., The, Chicago 46, Ill.

For use with oxygen, Type Nos. 1140, 1600, -01, -02, -20, -21, -61, 1830, -81, 3021, 3021, -23, -24, 3876, -77, 3976, 4285, -86, -87, 5437, 5515X, 8096, 9121, -41, -81, -81, 10979, 12736X, 624.54300, M3060, -61, -70, -70N, -70R. **For use with air,** Type Nos. 1140, 1140B, -B, -C, -HA, -HB, -HC, -PA, 1147, 1482, 1482P, -PR, -R, 1483, 1483P, -PR, -R, 1484, 1484P, -PR, -R, 1486, 1486P, -PR, -R, 1488, 1488P, -PR, -R. **For use with acetylene or LP-Gas,** Type Nos. 1105, 1603, -04, -05, -23, -25, -54, -54L, -54MC, -55, 2063, -63, 3981, -65, -71, 5515A, 5438, 12736P, 624.54310. **For use with hydrogen,** Type Nos. 1068, 1896, -07, -26, -27, 1887, 2066, 10871, 12736H, M3066, -67, -72R, -79, -79N, -79R, 10871. **For use with hydrogen or helium,** Type No. 2067. **For use with argon or oxygen,** Type No. 2060. **For use with hydrogen sulfide,** Type No. 12736HSL. **For use with carbon dioxide,** Type Nos. 33, 34, 36, 164, 165, 177, 177H, 181, 184, 1190, 11946, 12294, 12423, 12736C, -CG. **For use with hydrogen or oxygen,** Type No. 2068. **For use with nitrogen,** Type Nos. 1603, 12196, -07, 12516, -17, 12736N, -NW, M3068. **For use with carbo-hydrogen,** Type No. 5869. **For use with acetylene, argon, helium, hydrogen, neon, nitrogen, nitrogen dioxide, nitric oxide, nitrous oxide, oxygen or xeon,** Type Nos. 1684, -86, -88. **For use with sulphur dioxide,** Type No. 12736S.

Marking: Listee's name, trade name, and type designation.

Beacon Devices, Inc., North Tonawanda, N. Y.

For use with nitrous oxide, oxygen, cyclopropane, helium, ethylene, carbon dioxide, oxygen-carbon dioxide mixtures, and the helium-oxygen mixtures, Model B-D-2. **For use with oxygen,** Model B-D-1.

Marking: Listee's name and model designation.

Cornelius Co., The, Anoka, Minn.

For use with carbon dioxide, Model COR-4025.

Marking: Listee's name and model designation.

Dockson Corp., Detroit 8, Mich.

For use with oxygen and carbon dioxide, Models 44, 45, 55, 134, 234. **For use with acetylene,** Models 44, 45, 55, 134, 234.

Marking: Listee's name and model designation.

General Dynamics Corp., Liquid Carbonic Div., Chicago 3, Ill.

For use with oxygen, Types LM-302, -442, -462, -480, -500, -502, RL-33, RO-88, -99-C, -99-W. **For use with acetylene or propane,** Types HP-55, LP-55, RA-22, -44, -88, -99. **For use with carbon dioxide,** Models HP-55-B, LP-55-B.

Marking: Listee's name, or "Gasweld," and type or model designation.

Hammon Precision Equipment Co., Oakland 21, Calif.

For use with argon, Model 263. **For use with acetylene or propane,** Models HP-55, LP-55, RA-22, -44, -88, -99, RP-22, -44, -88, 206, 206-C, 207, 208, 209, 209-0, 211, 212, 217, 218, 219-A, 220, 221, 251, 252, 257, 258. **For use with carbon dioxide,** Models 244, 401, 416, 421, 441, 446. **For use with helium,** Models 262, 417-He, 422-He, 442-He, 447-He. **For use with hydrogen,** Models RH-22, -44, 224, 261. **For use with nitrogen,** Models 225, 226, 259, 260. **For use with nitrous oxide,** Models 404, 419, 424, 444, 449. **For use with oxygen,** Models LM-302, -442, -462, -480, -500, -502, RL-33, RO-22, -44, -88, -99-C, -99-W, 206, 210, 215, 216, 219, 222, 223, 250, 255, 256, 400, 401, 403, 405, 415-418 incl., 420-423 incl., 440-443 incl., 445-449 incl.

Marking: Listee's name, address, and model designation.

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Gas Appliances—Valves, Reducing—*Continued*

Harris Calorific Co., The, Cleveland 2, Ohio.

For use with acetylene air, argon, hydrogen, nitrogen, oxygen, Model 40 with or without prefix and/or suffix numbers. For use with acetylene, butane or propane, Models 90-D, -P, 90-D, -P, 77D, -P, 92-SC; 92-28C with suffixes -C2, -C3, -D, -G, -K4, -L, -P, -R1, -R2, -RV1, -RV2; 92-3D, 92-3P, 440-D, -P, 441-D, -P. For use with air, argon, helium, hydrogen, krypton, neon, nitrogen, or xenon, Models 87-B, -K, and Models 92-SC, 28C with suffixes -B1, -B2, -B3, -C1, -H, -K1, -K2, -K3, -K5, -T2, -T3, -T4, -U1, or U2. For use with carbohydrogen, Model 92-28C-S. For use with carbon dioxide, Models 29-ER, 92-28C-E. For use with ethylene or methane, Model 92-28C with suffix letters -B3, -KG or -T1. For use with liquefied petroleum gas, Models X-77-D, -P. For use with nitrous oxide, Model 92-28C-E. For use with oxygen, Models X-25, 25, 29, 77, 77A, 87, 92-3, X-92-4, 92-SC; 92-28C with or without suffixes -E, -F, -J, -N, -Q1, -Q2, -QV1, or -QV2; 92-SC, 440, 440-ER, -W, 441, 442, 443.
Marking: Name and address or listee and model designation.

Hoke, Inc., Cresskill, N. J.

For use with oxygen, hydrogen, acetylene, Types B, D, DS, FM, FS, K, KS, LF, LM, M, MS, P, R, T, TS, V, VS, XL.
Marking: "Hoke-Phoenix" and type designation.

Hudson Oxygen Therapy Sales Co., Los Angeles 27, Calif.

For use with oxygen, Models OT-300, -301, -301-S, -302 to -305 incl., -310, -700, -3022, -3024, -3100.
Marking: Listee's name, address, and model designation.

K-G Equipment Co., Inc., The, Allentown, Pa.

For use with oxygen, Models 1100, 1102, 1180, 1190, 1199, 1200, 1201, 1202, 1280, 1290, 1299, 1300, 1301, 1302, 1500, 1501, 1502, 1601. For use with acetylene, Models 1103, 1104, 1105, 1203, 1204, 1205, 1303, 1304, 1305, 1503, 1603-1606 incl., 1625, 1635. For use with hydrogen, Models 1106, 1186, 1196, 1206, 1286, 1296, 1306, 1506. For use with carbon dioxide, Models 1107, 1187, 1197, 1207, 1287, 1297, 1307, 1607, 1627, 1637, 1647. For use with nitrogen, 1108, 1188, 1198, 1208, 1288, 1298, 1308, 1508, 1608, 1617-1619 incl. For use with propane, Models 1109, 1209, 1309, 1509, 1609. For use with argon, Models 1181, 1191, 1281, 1291. For use with helium, Models 1182, 1192, 1282, 1292. For use with air, Model 1613.
Marking: Listee's name and model designation.

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

For use with acetylene, Types R39, R44, R66, R68, R73, R81, R84, R84aux, R90, R96, R208, R208CA, R207, R209, R411B, R411MC, R413, R415B, -MC, R551. For use with argon, Types R502, R509. For use with carbon dioxide, Types R69, R505, R506, XAH056, XAK013. For use with helium, Type R503. For use with hydrogen, Type R67, R216, R219. For use with liquefied petroleum gas, Types R75, R99, R552, 416. For use with nitrogen, Types R-32-A, R204. For use with oxygen, Types R32, R37, R38, R52, R64, R65, R79, R79-MP, -MS, R80, R82, R83, R83aux, R88, R89, R95, R201, R202, R205, R206, R208, R412, R414-C, R501, R504, R550.
Marking: Trade-mark "Linde," "Oxweld," "Prest-O-Lite," "Prest-O-Weld," or "Purox" and type designation.

McKesson Appliance Co., Toledo 10, Ohio.

For use with oxygen and carbon dioxide, Models EO-299, 2035, -36, -37, -38, -39, 2104, -05, -06, -07, -08, -09, 2114, -15, -16, -17, -18, -19, 2124, -25, -26, -27, -28, -29, 2200, -01, -02, -03, -04.
Marking: Listee's name and model designation.

Marquette Manufacturing Co., Div. of Marquette Corp., Minneapolis 14, Minn.

For use with oxygen, Models GW6-1-10, GW6-3-10, R, RT, XR, XRT. For use with oxygen and air, Models L1, L3. For use with acetylene, Models GW6-1-20, GW6-3-20, GW6-5-60, -25, L2, RD, RP, RTD, RTP.
Marking: Listee's name and model designation.

Matheson Co., Inc., The, East Rutherford, N. J.

For use with oxygen, hydrogen, carbon dioxide, Nos. 8136-1A to -1Z incl., 8136-11G, -11K, 92SC-8A to -8Z incl., 93SC-9A to -9Z incl.
Marking: Listee's name and number designation.

Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.

For use with oxygen, Model R-5.
Marking: Listee's name and model designation.

Metco, Inc., Westbury, L. I., N. Y.

For use with oxygen, Type GO. For use with acetylene, Type GA.
Marking: Listee's name and type designation.

Modern Engineering Co., St. Louis 3, Mo.

For use with air and natural gas, Type P125. For use with acetylene, argon, carbon [illegible], hydrogen, nitrogen, and oxygen, Types F, G, J, O-300, or OR-600, P-200. [illegible] Type S.

ITED CLOSE TO EDGE

Gas Appliances—Valves, Reducing—*Continued*

Montgomery Ward & Co., Inc., Chicago 7, Ill.

For use with acetylene, Model HB-5894A. For use with acetylene, butane or propane, Models HB-5889A, -5889B, -5892A, -5892B. For use with oxygen, Models HB-5893, -5893A.
Marking: "Powr-Kraft" and model designation.

Nageldinger & Son, Inc., John, Bronx 55, N. Y.

For use with oxygen, hydrogen, acetylene, Styles N, N1.
Marking: "Nageldinger," "Trex Engineering Supply Co.," and/or "302" and style designation.

National Cylinder Gas, Div. of Chemetron Corp., Chicago 11, Ill.

For use with oxygen, Models *1140, 1600, 1601, 1602, 1620, 1621, 1380, 1381,* 5000, 5001, *5070,* 5401, 5402, 5480, 5480M, 5481, 5481M, 5482, 5482M, 5486, 5486M, 5487, 5497M, 5796-1, 5796-2, -22, 5797-2, *5860,* 5901, 5902, 6200, 6201-2, 6202, 6480, 6480M, 6481, 6482, 6482K, 6486, 6486M, 6487, 6487M, 6501, 6502, 6581, 6582, *C5860,* X202. For use with acetylene and liquefied petroleum gases, Models *1603, 1605, 1622, 1625,* 5403, 5405, *5855,* 5856, 5902, 5905, 6203, 6503, 6505, 6583, 6585. For use with acetylene, Models 1624, 1634, 5903, 5906, 5971, 5404, 5904, 6504, 6584. For use with hydrogen, Models *1606, 1607, 1626, 1627, 1637, 5066, 5067, 5072, 5073,* 5407, 5407-1, 5796-7, 5797-7, *5366, 5367,* 5907, 5907-1, 6507, 6507-1, 6587, 6587-1. For use with helium, Models 5796-6, *5367-H,* 6580-H. For use with nitrogen, Models 5408, 5408-1, 5796-8, -82, *5368,* 5908, 5908-1, 6508, 6508-1, -10, 6588, 6588-1. For use with carbon dioxide, Models 5472, 5476, 5477, 5976, 6472, 6580-10, 6592. For use with carbo-hydrogen, Models *1609,* 5409, 5796-9, *5369,* 5909, 6580, 6590. For use with argon, Models 5796-0, *5360A,* 6580-A. For use with air, Model *1187.* For use with nitrous oxide, Models 5492, 6492.
Marking: Listee's name, "Rego," "NCG," and model designation.

National Welding Equipment Co., San Francisco 5, Calif.

For use with oxygen or carbon dioxide, Models 701, 711, 713, 713-CA, 714, 715, 721, 722, 723, 723-CA, 754, 761, 762, 762-T1, -TM, 763, 764T1, -TM, P-2024 to -27 incl. For use with acetylene, Models 703, 713, 713-CA, 723, 723-CA, 753, 763, 763-CA. For use with LP-Gas, Models 703, 713, 723, 753, 763.
Marking: Listee's name and model designation.

Norgren Co., C. A., Englewood, Colo.

For use with air, argon, carbon dioxide, helium, krypton, neon, nitrogen, oxygen, and xenon, Type 4C*2B. For use with air, argon, krypton, carbon dioxide, helium, nitrogen, and xenon, Types 20AN*2, 20BN*2.
***Additional letter.**
Marking: Listee's name and type designation on bonnet.

O.E.M. Corp., East Norwalk, Conn.

For use with oxygen, Nos. 802X, 804, *4191, 5092.*
Marking: Listee's name and number designation.

Ohio Chemical & Surgical Equipment Co., A Division of Air Reduction Company, Incorporated, Madison 10, Wis.

For use with oxygen, hydrogen, acetylene, Cat. No. 8477.
Marking: Listee's name and catalog designation.

Puritan Equipment, Inc., Kansas City 8, Mo.

For use with oxygen, Type 122-P.
Marking: Listee's name and type designation.

S-S Co., Brooklyn 22, N. Y.

For use with oxygen, Model 088. For use with acetylene, Model A88.
Marking: Listee's name and model designation.

Sears, Roebuck & Co., Chicago 7, Ill.

For use with oxygen, Cat. Nos. 624.54300, 624.54370, 624.54480, 624.5515X. For use with acetylene or LP-Gas, Cat. Nos. 624.54310, 624.54380, 624.5515A.
Marking: "Craftsman" and catalog designation.

Tap-Rite Products Corp., Hackensack, N. J.

For use with propane, Model 611-P.
Marking: Listee's name and model designation.

Tescom Corp., Smith Welding Equipment Div., Minneapolis 14, Minn.

For use with air, hydrogen, oxygen, propane, nitrogen, or carbon dioxide, Stock Nos. H97, H99A, H99F, H100, H100C, H100S, H101P, H102E, H102ES, H102F, H103, H103B, H103C, H103 O.P., H312, H313, H313C, H314P, H315P, H316A, H317A, H318, H319, H319 O.P., H400, H401, H402, H403, H420, H421, H422, H423, H450A, H451A, H470A O.P., H471A O.P., H480, H481, H490, H491, H712, H713, H714P, H715P. **For use with air or oxygen,** Stock Nos. H501A, H503, H505, H517, H518, H519, H520, H521, H544, H547, H548, H549, H716, H717, H720, H721, H730. **For use with acetylene,** Stock Nos. H98, H98P, H101J, H101JS, H101P, H101PS, H314, H314P, H315, H315P, H536, H539, H541, H714, H715, H718, H719, H722, H723, H725, H727, H825, H826, H827, H828.
For use with liquefied petroleum gases, Stock Nos. H825, H826, H826B-1, H827, H828. **For use with argon,** Stock Nos. H1100, H1200, H1201. **For use with** Stock Nos. H1110, H1210, H1211.
Marking: Listee's name and address and stock designation on body.

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Gas Appliances—Valves, Reducing—*Continued*

Universal Cutting & Welding Equipment Mfg. Co., Inc., Ft. Lauderdale, Fla.

For use with acetylene, Types R-B, -MC.
Marking: Listee's name or trade name and type designation.

Victor Equipment Co., San Francisco 7, Calif.

For use with air, argon, carbon dioxide, helium, hydrogen, nitrogen, oxygen, or propane, Models GD-10, -30, -31, HSR-201, -202, -203, HVTS-201, -202, -203, NPVTS-200, PVTS-200, SR-95, -97, -200, -200ML, -200MP, -200MS, -201, -202, -400, -401, -402, -411, -430, -431, -432, -470, -471, -472, -700, -700M, -700M2, -701, -701M, -701M2, -702, -702M, -702M2, -703, -703M, -703M2, -711M2, SSR-200, -203, -203N, -203P, -210, -211, VGS-430, VGT-430, VN-60, -66, VTS-200, -200MA, -200ML, -200MP, -200MS, -201, -202, -203, -210, -211, -400, -401, -402, -403, -411, -430, -431, -432, -433, -440, -441, -442, -443, -700, -700M, -700M2, -701, -701M, -701M2, -702, -702M, -702M2, -703, -703M, -703M2, -711M2. For use with argon, helium, hydrogen, nitrogen, oxygen, and propane, Models L1A-L6A incl., L10-L12 incl., L16, L18. For use with acetylene, Models L4A, HSR-210, NPSR-210, PSR-210, SR-96, -216, -410, -710, -710M, SSR-210, VGS-410, VGT-410, VN-60, VTS-210, -410, -710, -710M.
Marking: Listee's name and model designation.

Watts Regulator Co., Lawrence, Mass.

For use with carbon dioxide, Model M, Types N26, N263. For use with acetylene, Model M2, Types 112, 112-F, -K, -M, -P, and Type 7, Models M, M-Z, M-Z1, M-Z2. For use with LP-Gas, Model M, Types N26, N263, Model M1, Types 112, 112-F, -K, -M, -P, and Type 6, Models M, M-Z, M-Z1, M-Z2, M-Z3, M-Z4.
Marking: Listee's name and model designation; listee's name, model, type and output pressure letter designations.

Weldit, Inc., Detroit 6, Mich.

For use with oxygen, Model Nos. 50C, -W, -WC. For use with hydrogen, Model 50H. For use with nitrogen, Model 50N. For use with acetylene, Models 50D, -P.
Marking: Listee's name and model designation.

York Engineering Co., Chicago 23, Ill.

For use with oxygen, Models 77, 78, 87, 97-968, -970, 98-970. For use with acetylene, Model 98-968.
Marking: Listee's name and model designation.

VALVES—SHUT-OFF, OXY-ACETYLENE (440 A19)

Oxy-acetylene shut-off valves are intended for use in controlling the flow of gases to torches to obviate the waste of gases and time necessitated by closing the torch valves and relighting between operations.

These valves are listed under Reexamination Service of Underwriters' Laboratories, Inc.

Reexamination Service

Bastian-Blessing Co., The, Chicago 46, Ill.

Model 4260.
Marking: "Rego" and model designation.

Linde Company, Division of Union Carbide Corporation, New York 17, N. Y.

Types V-30, -31.
Marking: Trade-mark "Oxweld" and type designation.

Weldit, Inc., Detroit 6, Mich.

Model E.
Marking: Listee's name and model designation.

LADDERS AND LADDER ACCESSORIES (240 A0)

Listings of the following items appear in this section: Ladders and Ladder Accessories.

ACCESSORIES (240 A1)

The accessories covered in this section are intended for use with labeled ladders.

Reexamination Service

Barberton Aluminum Specialities, Inc., Barberton, Ohio.

Ladder leveler, Model No. 3-A.
Marking: Listee's name and model designation.

Dayton Safety Ladder Co., The, Cincinnati 6, Ohio.

Ladder shoes, Types 400, A-500.
Marking: Listee's name or trade name "Dayton" and type designation.

TED CLOSE TO EDGE

Ladders and Ladder Accessories—*Continued*

Duo-Safety Ladder Corp., Oshkosh, Wis.

Ladder shoes, Type SSW.
Marking: Duo-Safety and type designation.

McDonald Co., B. F., Los Angeles 45, Calif.

Ladder shoe, Cat. No. 490008.
Marking: Listee's name and catalog designation.

Rose Mfg. Co., Denver 4, Colo.

Ladder shoe, Model 601 for step ladders and Model 600 for straight ladders.
Marking: Listee's name and model designation.

LADDERS (240 A12)

LOOK FOR THE LABEL

Ladders, both wood and metal, covered in this section, are intended for general use in households or in commercial establishments. These ladders consist of step ladders, straight, extension, sectional, trestle, extension trestle, and special service ladders.
The following cautionary marking will appear on each labeled metal ladder: "Caution: Metal ladders should not be used where contact may be made with electrical circuits."
Ladders are listed under the Label Service of Underwriters' Laboratories, Inc. and are identified by the label as illustrated below:

Underwriters' Laboratories, Inc.
®
INSPECTED
Ladder
No.——

The label of Underwriters' Laboratories, Inc. attached to the product is evidence that such a product has been produced under the Factory Inspection and Label Service Program.
Inspection at the factory include countercheck of design, construction, material and assembly.

Label Service

American Ladder Corp., Amityville, N. Y.

Metal: Two-section extension, single, stepladders.

Babcock Co., Inc., The W. W., Bath, N. Y.

Wood: Step, twin front step, platform, stock room, straight and two section extension.

Berg Mfg. Co., John, Chicago 9, Ill.

Wood: Step, straight and extension, trestles and extension trestles.

Carolina Ladder Co., Inc., Charleston 61, S. C.

Wood: Step, single and two-section extension.

Chesebro-Whitman Co., Long Island City 1, N. Y.

Wood: Single, two-section extension, extension trestle, trestle, step and platform.

Chesebro-Whitman Mfg. Corp., Newark Valley, N. Y.

Wood: Single, two-section extension, extension trestle, trestle, step, platform, sectional, and mason. Metal: Single, two-section extension, step, platform, and step stool.

Clark Co., The J. R., Spring Park, Minn., Reading, Pa.

Wood: Platform step, single, two section extension, trestle, extension trestle, and sectional. Metal: step, single, two section extension.

Dayton Safety Ladder Co., The, Cincinnati, Ohio.

Platform, single step and extension ladders.

Flint Co., A. W., New Haven 6, Conn.

Wood: Single, two-section extension, step, platform, trestle, extension trestle, window cleaner, and sectional.

Florida Ladder Co., Sarasota, Fla.

Wood: Step, straight and extension, extension trestle.

Goshen Mfg. Co., The, Goshen, Ind.

Wood: Platform stem, step, single, two-section extension, trestle, extension trestle, and twin front step.
Metal: Step, step stool, single, two-section extension.

Griffith Ladder Mfg. Co., Waverly, Mass.

Wood: Step, single and two-section extension.

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Ladders and Ladder Accessories—Ladders—*Continued*

Johnson Mfg. Co., Pat, Dallas, Texas.

Wood: Step and two-section extension.

Louisville Ladder Co., Louisville 10, Ky.

Metal: Single, two-section extension, step, twin front step, platform.

Michigan Ladder Co., Ypsilanti, Mich.

Wood: extension, platform, and step.

Montgomery Ward & Co., Inc., Chicago 7, Ill.

Metal: Step, two-section extension, step stool.

Moulton Ladder Mfg. Co., Somerville 43, Mass.

Wood: Step.

Newark Ladder & Bracket Co., Inc., Clark (P. O. Rahway), N. J.

Wood: Step, single, and two-section extension. Metal: Two-section extension, single.

Patent Scaffolding Co., Inc., The, Long Island City 1, N. Y., Chicago 22, Ill.

Wood: Single, two-section extension, extension trestle, trestle, step, and platform. Metal: Single, two-section, step, platform, and step stool.

Tilley Ladders Co., Inc., The John S., Watervliet, N. Y., Davenport, Iowa.

Wood: Single, two-section extension, platform, step, extension trestle. Metal: Single, two-section extension, step.

Topping Ladder Co., Marion, N. Y.

Wood: Step.

Werner Co., Inc., R. D., Greenville, Pa.

Metal: Platform, step, single, two-section extension, three-section extension, aircraft single, aircraft two-section, twin front step and step stools.

Woodenware Products Corp., St. Louis 1, Mo.

Wood: Step, trestle, extension trestle, platform, single, sectional and two-section extension.

MACHINE, LEATHER-EDGING (540 I0)

Reexamination Service

United Shoe Machinery Corporation, Boston, Mass.

"USMC" leather edging machine having oxy-acetylene heating blowpipe and power-driven feed mechanism. Made in one size only: Model B.
Marking: Name of manufacturer and model designation on name plate attached to frame.

MEDICAL GAS HOSE COUPLINGS (540 I0)

Reexamination Service

Air Products, Inc., Allentown, Pa.

Hose coupling assemblies for use in hospitals for distribution of oxygen, nitrous oxide, and suction in rigid piping at pressures not exceeding 100 psi.

Gas Service	Connector	Coupler
Oxygen	990-02	745-0_2
Nitrous Oxide	992-N_20	605-N_20
Vacuum (Suction)	991-S, 688B-S	607-S, 663B-S

Marking: Listee's name on use identification plate, and letter "M" and numbers on couplers and connectors.

Melchior, Armstrong, Dessau, Inc., Ridgefield, N. J.

Hose coupling assemblies for use in hospitals for distribution of air, oxygen, nitrous oxide, and suction in rigid piping at pressures not exceeding 100 psi.

Gas Service	Connector	Coupler
Oxygen	689B-0_2, 990-0_2	745-0_2
Nitrous Oxide	687A-N_20, 992-N_20	605-N_20
	687B-N_20	592C-N_20
Vacuum (Suction)	688A-S, 991-S	607-S
	688B-S	663B-S
Air	686B-CA	860B-CA

Marking: Listee's name on use identification plate, and letter "M" and numbers on couplers and connectors.

FED CLOSE TO EDGE

Medical Gas Hose Couplings—*Continued*

National Cylinder Gas, Div. of Chemetron Corp., Chicago 11, Ill.

Hose couplings for use in systems distributing oxygen, nitrous oxide, air or carbon dioxide in hospitals in rigid piping systems at pressures not exceeding 70 psig.

	Locking Mechanism and Valve Assembly Part Nos.	Plug Model Nos.
Oxygen	23811	22970, 22971, 22976
Vacuum	23817	22972
Nitrous Oxide	23819	22973
Air	23821	22974
Carbon Dioxide	23823	22975

Locking mechanism and valve assemblies are employed on Station Outlet Model Nos. 238-50, 239-50 with or without one of the following suffix letters: A, C, N, or V; and Models 238-52, 239-52, -53.

	Valve Assembly Adapter	Plug Model Nos.
Oxygen	23607	23602
Vacuum	23608	23603
Nitrous	23610	23609
Air	23609	23605
Carbon Dioxide	23611	23606

Valve assembly adapters are employed on Station Outlet Model 236-50 with or without one of the following suffix letters: A, C, N, or V and with Models 236-52, -53.

Marking: Listee's trade-mark "NCG," model number, and type of gas on plug. Listee's trade-mark "NCG," part number, and type of gas on valve assembly.

Ohio Chemical & Surgical Equipment Co., A Division of Air Reduction Company, Incorporated, Madison 10, Wis.

Hose couplings for use in systems distributing oxygen, nitrous oxide, or air in hospitals in rigid piping systems at pressures not exceeding 50 psig.

Gas Service	Valve Assembly Model No.	Adapter Model No.
Oxygen	30	30A
Nitrous Oxide	31	31A
Vacuum	32	32A
Air	33	33A

Marking: Listee's trade name "Ohio," model designation and gas service on valve assembly and on adapter.

REGULATORS, GAS-PRESSURE (540 I0)

Reexamination Service

Bastian-Blessing Co., The, Chicago 30, Ill.

"Rego" gas-pressure regulators intended for use with oxygen, hydrogen, nitrogen, and other gases at inlet pressure not over 200 psi and outlet pressure not over 30 psi. Made in following numbers: 2303, 2403, 2503, 3022, 3223.

Marking: "Rego" and number designation.

RELAYS (101 L18)

Reexamination Service

Anderson & Co., C. J., A Div. of Western Industries, Inc., Chicago 10, Ill.

"C.J.A." phase failure and reverse-phase, two- and three-phase, Types RP-2, RW-2.

Marking: Listee's name and type designation.

Thompson, Inc., O., Woodside 77, N. Y.

Reverse phase relay and phase failure, two- and three-phase, Type A.

Marking: Listee's trade name "Olof" and type designation.

RELIEF VALVES, TRANSFORMER (540 I0)

Reexamination Service

Bastian-Blessing Co., The, Chicago 30, Ill.

Rego pressure relief valves designed for use on oil filled transformers, Series 4230, -PA, -PB, -WA, -WE, -WF, 4668-10, -20, 11264, -A, -B, -C, 11265, 14493, 15320, 4858-828PT21 to -24 incl.

Marking: Listee's name, series designation and relief pressure stamped on valve.

SCAFFOLDING (380 C0)

This listing includes Devices (Scaffolding) and Equipment (Scaffolding).

DEVICES (SCAFFOLDING) (380 C4)

LOOK FOR THE LABEL

These are fabricated assemblies, including (a) decorators planks usually [illegible] with ladders, and (b) stage platforms for swinging stages.

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Scaffolding—Devices (Scaffolding)—*Continued*

The installation of these devices is not inspected by Underwriters' Laboratories, Inc. but should be made in accordance with requirements of authorities having jurisdiction.

The Laboratories' investigation includes strength tests to determine the ability of the device to carry rated load with a factor of safety of four. The load capacity is indicated in the individual listings.

These devices are listed under Label Service of Underwriters' Laboratories, Inc. The label of Underwriters' Laboratories, Inc. attached to the product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

American Ladder Corp., Amityville, L. I., N. Y.

Metal decorator planks rated 250 lbs.

Chesebro-Whitman Mfg. Corp., Newark Valley, N. Y.

Decorator planks rated 250 lbs, stage platforms rated 500 lbs.

Clark Co., The J. R., Spring Park, Minn.

Decorators planks: Wood, extension type rated 250 lbs.

Flint Co., A. W., New Haven 6, Conn.

Wood decorators planks rated 250 lbs.

Florida Ladder Co., Sarasota, Fla.

Wood decorator planks rated 250 lbs.

Louisville Ladder Co., Louisville 10, Ky.

Metal: Decorators planks rated 250 lbs; scaffold planks rated 500 lbs; swing stage platforms rated 500 lbs; fixed stage platforms rated 750 lbs.

Tilley Ladders Co., Inc., The John S., Watervliet, N. Y.

Decorators planks, rated 250 lbs.

Werner Co., Inc., R. D., Greenville, Pa.

Metal: Decorators planks rated 250 lbs, scaffold planks rated 500 lbs, swing stage platforms rated 500 lbs, fixed stage platforms rated 750 lbs.

EQUIPMENT (SCAFFOLDING) (380 C5)

Equipment listed under this heading includes: (a) Winches intended for use with suspended scaffolds and (b) sets of frames, braces, brackets and accessories for use in the erection of fixed or rolling scaffolds.

The separate parts covered by (b) are inspected at the factory by Underwriters' Laboratories, Inc. Installations of such parts are not inspected by Underwriters' Laboratories, Inc., but should be made in accordance with requirements of authorities having jurisdiction.

Reexamination Service

Baker-Roos, Inc., Indianapolis 6, Ind.

End frames, Part Nos. A, A2, A5; trusses, Part Nos. B, B6, B8, B10, D, R, S, SP, T, T4; platforms, Part Nos. C, C6, C8, C10; base extensions, Part Nos. O, OC, OW; stairway, Part No. SW.

Marking: Trade name "Baker" and/or listee's name and part designation.

Beaver—Advance Corp., Ellwood City, Pa.

End frames, Nos. 205, 305, 465, 465G, -L, 405, 505, 505L, -M, 565, 605, 665, 665G; bracket, Nos. 20E, 24E; adjustment screw, No. 15J; putlog Nos. 14, 16, 18, 20.

Marking: Number of each part, trade name "Advance" and/or name and address of listee on each part.

Bil-Jax, Inc., Archbold, Ohio.

Bracket, Part No. ST77-20; catwalks, Part Nos. MT68-6, -8, MT59-6, -8.

End frames with diagonals: Part Nos. ST-36, -55, -366, -516, -566, -6666 with prefix letter "O"; SP-52, -53, ST42-9; ST-33L, -34L, -35L, -36L, -42, -43, -44, -45, -46L, -51-2, -51-3, -51-4, -51-5, -53, -53L, -54, -54E, -54L, -55, -55L, -56, -283L, -284L, -285L, -286L, -366, -546, -546L, -566, -566L with or without prefix letters PG; Part Nos. ST72-7, -10, -66, -76.

Maintenance trestle comprising Part Nos. MT50-4, -5, -8, MT51-51A, -51B, -51C, -52, -52A, MT53, -53B, -54, MT57-5, -6, -7, -66, -76.

Sidewalk bridge comprising Part Nos. SW-10, -11.

"Painter's" scaffold winch for suspended scaffolds. Maximum safe loading per winch, [illegible] lb.

Marking: Listee's name, part, and model designation.

NTED CLOSE TO EDGE

Scaffolding—Equipment (Scaffolding)—*Continued*

Deal Products, Inc., Easton, Pa.

End frames, Part Nos. OR-4, S-1 to S-6 incl., S-428, S-436, S-446L, S-446S, S-528, S-536, S-546L, S-546S, S-628, S-636, WT-360, -556; braces, Part Nos. GR-56, HB-7, -10, -48, -76, SB-7, -10, -66, -76, XB-1, -2, -3, -7; brackets, Part Nos. SB-20, -24, -30; bases, Part Nos. SC-2, -3, SWB-8; jacks, Part Nos. A5-30, RBL-30, SBL-30; posts, Part Nos. GP-43, GPC-53; stacking pin, Part No. SC-1; platform, Part Nos. CW-6, -66, -247, CWT-7, -10, -76, -247.

Marking: Listee's name or trade name "Deal" and part designation.

Newark Ladder & Bracket Co., Inc., Clark, N. J.

End frames, Part Nos. LF36, -55, PF44, -55, TF565; braces, Part Nos. GR3 to -7 incl., -10, -75, HS6, -7, -10, -75, VB6, -7; bracket, Part No. SB20; base plates, Part Nos. PB1, -2; posts, Part Nos. GRP1, -2; screw jacks, Part Nos. SJ16, SJ18.

Marking: Listee's name or trade name "Newark" or letter "N" and part designation on each part.

Scaffold winch, Model No. 1 suitable for max load of 1490 lbs.

Marking: Listee's name or trade name "Newark" and model designation.

Northside Welding Co., Indianapolis 20, Ind.

End frame, Part No. EF34-8; braces, Part Nos. SB64-8, -63-8; platform, Part No. BH-8; bases, Part No. BP12-8; casters, Part No. C54-8.

Marking: Listee's name and part designation.

Patent Scaffolding Co., Inc., The, Long Island City 1, N. Y., Chicago 22, Ill., Los Angeles 1, Calif.

Scaffolding machines and equipment for construction of suspended scaffolding for use in building construction. Types: "Mason Suspended Scaffold," rated load 3000 lb; "Twin-Drum Scaffold," rated load 2300 lb; "Gold Medal Junior," rated load—steel winch, 1000 lb, aluminum winch, 1050 lb; Model "HS" Midget Machine, rated load 300 lb.

Marking: Name and address of listee and type or model designation on name plate attached to machine unit.

Folding scaffold assemblies, Models A and B, composed of base units, Part Nos. RSF101-A, -B; upper units, Part Nos. RSF101-A, -B, RSF102, -103; braces, Part Nos. RSL16-1, -2, -3, RSL-35.

Span scaffold assemblies composed of end frames, Part Nos. RSL-1, -2, -3, -4, -5, -51, -52, -53, -54, -71 to -75 incl.; stairway, Part No. RSL-5; braces, Part Nos. RSL16-1, -2, -3; platform frame, Part Nos. RSL-6, -17, -18, -19, -76, -78.

Marking: Listee's name and part designation.

Safway Steel Products, Inc., Milwaukee 13, Wis.

End frames, Nos. AF-5, EF-3, -5, -6, F-3, -4, -46, J-1, LA-3, -5, -6, LS-3, -5, -6, LS3-1, putlogs, Nos. P-18, -22, bracket, No. BR-30E, screw jack, No. AL-2.

"Budget Swing" Model A swing stage winch, stirrup, and cable. Used to support stages or planks. Safe load per winch 350 lb.

"Saf-T-Swing" swing stage winch and stirrup. Comprising hand-cranked cable and drum machine with attached stirrup for supporting stage. Used for light duty scaffold stage supported by one winch at each end. Safe loading per winch 625 lb.

"Senior" swing stage winch comprising ratchet-operated cable drum and frame for attachment to steel putlog for plank platform. For suspended mason's scaffold with two machines on each putlog; platform width 8 ft maximum with putlog spacing of 8 ft max. Safe load per winch, 3350 lb.

Marking: Trade name "Safway" and/or name of listee and part designation on each part.

Sasgen Derrick Co., Chicago 22, Ill.

"Painter's," "Stone-Setter's," "Bricklayer's," "Cam-Lock" scaffold winches for suspended scaffolds. Maximum safe loading per winch: "Painter's" 1642 lb., "Stone-Setter's" 1785 lb., "Bricklayer's" 3067 lb., "Cam-Lock" 500 lb.

Marking: Listee's name and type designation.

Spring-Lock Scaffolding Co., Philadelphia 22, Pa.

End frames, Model Nos. F-100, -101, -104, -105, -115, -120, -125, -130, -135, -140, -145, -200, LF-143, -145, -146, MF-300, -315, -366; cross braces, Model Nos. CB-20, -21, -60, -61, -70, -71, -80, -81, -90, -91.

Marking: Listee's trade name, address and model designation on each device.

Steel Scaffolding Co., Inc., The, Uniontown, Pa.

"Trouble Saver" steel scaffolding equipment comprising tubular-welded end frames, diagonal cross braces, and accessories.

Marking: Listee's name and trade name on each part.

Swing-Lo Suspended Scaffold Co., Covert, Mich.

Scissor hangers for suspended platforms rated 500 lbs per unit, Models 88, 99, HD66 with bracket, Models 101, 102, 201, 202, 301, 302, 401, 402, 501, 502, 601, 701.

Scissor hangers for suspended platforms rated 1000 lbs per unit, Models SHD-66, MHD-66, PHD-66 with bracket, Model HD-701.

Joist hook hangers for suspended platforms rated 500 lbs per unit, Model 77; with bracket, Model 702.

Marking: Listee's name and model designation.

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Scaffolding—Equipment (Scaffolding)—*Continued*

Tubular Structures Corp. of America, Los Angeles 39, Calif.

End frames, Part Nos. 123, 125, 126, 153B, 156M, 1546C; frame extension, Part No. 151; adjustment screw, Part No. 316; caster, Part No. 310; ladder frame, Part No. 340; putlogs, Part Nos. 360, 361; brackets, Part Nos. 330, 331.
Marking: Listee's name and part designation.

Universal Manufacturing Corp., Zelienople, Pa.

"Kwikbilt" steel scaffolding equipment comprising tubular-welded steel frames, diagonal cross braces, and accessories.
End frames, Part Nos. LS-4-2, -6-2, LSB-6-2, NH-6½-5, NL-2½-5, -3-5, -5-3, -6-3, NU-4½-5, -5-5X, NUL-4-5, NY-4-5, -4½-5, -5-5, PL-1-5, -2-5, SH-6½-5, -6½L-5, SK-4-5, -4-4, -5-5, SL-2½-5, -3-5, SS-4½-5, -5-5, -5L-5, -5L-51N, ST-5-4, SU-4-5, -4½-5, -4½-5X, -5-5, -5-5X, SUL-4-5, SWE-7-5. Brackets, Part Nos. SB-22, -26, -30, -36, -40, SBE-22, -26, -30. Putlogs, Part Nos. PSW-12, -22, TRS-12, -21. Bridge section, Part Nos. LSH-7-0, -10-6, -12-0, -13-6. Adjustable base, Part No. S-25-8.
Marking: Listee's name and part designation.

Up-Right, Inc., Berkeley 2, Calif.

End frames, Part Nos. 166-B, 195-B, 209-B; braces, Part Nos. 105-B, 210-B, 221-B, 223-B, 364-B, 365-B; casters, Part No. 190-B; platform frames, Part Nos. 208-B, 361-B, 362-B.
Marking: Trade name and/or name of listee and part designation.

Waco Mfg. Co., Minneapolis 16, Minn.

End frames, Nos. 123, 125, 126, 153, 154A, -B, -C, 154-6A, -6B, -6C, 155, 155A, 156, 156B; caster, No. 310; frame extension, No. 151; adjustment screw, No. 306; brackets, Nos. 330, 331; ladder, No. 340; putlogs, Nos. 360-8, -12, 361-16, -22; brace, No. 255.
Marking: Listee's name and number designation.

Werner Co., Inc., R. D., Greenville, Pa.

Bridge scaffold assemblies, Model Nos. 4301 (6 ft), 4302 (9 ft), 4303 (12 ft), 4304 (15 ft), composed of end frame, Part No. 40257; vertical posts, Part Nos. 40209, 40233, 40234, 40251; adapters, Part Nos. 40235, 40574; braces, Part Nos. 40241, 40245-4, -5, -6, 40254; caster, Part No. 40270; step, Part No. 40240.
Six and 9 ft assemblies are rated 500 or 750 lbs when used with manufacturer's labeled stages rated 500 or 750 lbs, respectively. Twelve and 15 ft assemblies are rated 500 lbs when used with labeled stages rated 500 or 750 lbs.
Span scaffold assemblies, composed of end frames, Part Nos. 40042, 40043, 40093, 40094, 40095, 40139, 40140, 40141; braces, Part Nos. 40012-4 to -12 incl.; platform board assemblies, Part Nos. 40086-1, -2, 40087-1, -2, 40088-1, -2, 40149-1, -2, 40150-1, -2, 40151-1, -2, 40152-1, -2, 40153-1, -2, 40154-1, -2; adjustable leg assemblies, Part No. 40112; interlock clips, Part Nos. 40009, 40048; support frames, Part Nos. 40050, 40155.
Stairway scaffold assemblies, Model 4001, composed of base section Part No. 40158; adjustable leg assemblies, Part No. 40112; braces, Part No. 40012-1; platform boards, Part Nos. 40044, 40045. Model 4005, composed of base section, Part No. 40162; adjustable leg assemblies, Part No. 40112; platform boards, Part Nos. 40061, 40062. Accessories, upper section, Part Nos. 40159, 40160, 40161; platform frames, Part Nos. 40065, 40111; platform boards, Part Nos. 40044, 40045, 40061, 40062; support frames, Part No. 40050; braces, Part Nos. 40012-2, -3, -13; interlock clips, Part Nos. 40009, 40048.
Marking: Listee's trade name "Aldek" or letters "W" or "A" and part number on each part.

Western Gear Corp., Belmont, Calif.

Scaffold winch, Model M2 with or without air attachment Model A2. Max safe load per winch, 1000 lb.
Marking: Listees' name and model designation.

STATION OUTLETS FOR MEDICAL GAS (540 I0)

Reexamination Service

National Cylinder Gas, Div. of Chemetron Corp., Chicago 11, Ill.

Station outlets for use in systems distributing oxygen, vacuum, nitrous oxide, air or carbon dioxide in hospitals in rigid piping systems at pressures not exceeding 100 psig.

Station Outlet (Ceiling)	Station Outlet (Wall)	Gas Service
236-50	238- or 239-50	Oxygen
236-50V	238- or 239-50V	Vacuum
236-50N	238- or 239-50N	Nitrous oxide
236-50A	238- or 239-50A	Air
236-50C	238- or 239-50C	Carbon dioxide

Marking: Listee's name and address, type of gas, model designation and statement "Use No. 0.1" on metal decal attached to face plate. Bridge of adapters stamped with listee's trade name "NCG," model designation of adapter and type of gas.

TOOLS, POWDER ACTUATED (400 O0)

LOOK FOR THE LABEL

These tools are for use in driving special studs or pins into concrete or steel using powder cartridges as a source of power.
In using these tools careful attention should be given to the instruction program provided by the manufacturer and to the type of receiving material into which the studs

TED CLOSE TO EDGE

Tools, Powder Actuated—*Continued*

Safety precautions to be observed are outlined in the "Operating Instructions" supplied with each tool.

Powder-actuated tools are listed under the Label Service of Underwriters' Laboratories, Inc.

Each listed powder-actuated tool bears a combination label incorporating the listee's name or trade-mark, together with other appropriate information, and the inspection manifest of Underwriters' Laboratories, Inc.

The Label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program. Inspection and tests at the factory include countercheck of design, construction, materials, assembly, and periodic tests to check proper operation of the tool.

Label Service

American International Tool Corp., Miami Beach 40, Fla.

Ammo Products, Inc., Portland 14, Ore.

Omark Industries, Inc., Portland 22, Ore.

Ramset Fastening System, Winchester-Western Division, Olin Mathieson Chemical Corporation, New Haven 4, Conn.

Remington Arms Co., Inc., Bridgeport 2, Conn.

Sileps, Inc., Charlotte 3, N. C.

Speed Fastener, Inc., St. Louis 1, Mo.

WEARING APPAREL (460 E0)

Reexamination Service

Whiting & Davis Co., Inc., Plainville, Mass.

Chain-mesh safety glove available in various sizes.
Marking: Listee's name and trade name.

WINCH, OIL TANK (540 I0)

Reexamination Service

Johnston & Jennings Co., The, Div. of Pettibone-Mulliken Corp., Oceco Div., Chicago 51, Ill.

"Oceco" safety tank winch, comprising a steel mounting plate, cast-iron brackets, cast-iron drum, worm gear and worm, and cast-steel crank handle; made in three sizes: No. 2, 8 in. between drum cheeks; No. 3, 10 in. between drum cheeks; No. 4, 15 in. between drum cheeks.
Marking: "Oceco" cast on handle and base of brackets and model designation.

WIRE ROPE CLAMPS (540 I0)

Reexamination Service

Lamson & Sessions Co., The, Cleveland 9, Ohio.

"Safe-Line."
Marking: Initials "SLC" and size on vise flat of half clamps.

WRINGERS, WASHING MACHINE (460 R0)

Reexamination Service

Chamberlain Corp., Waterloo, Iowa.

Series Nos. 8, 10, 13, 30, 40, 41, 43, 70, 71, 72, 78, 80, 90, 95, 110-118 incl. with two digit suffix numbers. Models 80, 80W, 81, 81W, 85, 85W, 86, 86W, 90, 90W, 95, 95W, 1180-1. Where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc.
Marking: Series or model designation and "SA770."

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Wringers, Washing Machine—*Continued*

Lovell Mfg. Co., Erie, Pa.

Washing machine wringers for power-operated washing machines made in the following basic models: 27, 27B, 32, 33, 33B, 34, 34B, -BX, -X, 35X, 36, 36B, -BX, -X, 37, 37B, -BX, -X, 38, 38B, 39, 39B, -BX, -X, 40, 40BX, -BXB, -X, 42, 42X, 52, 52X, 53BX, -BXH, 54, 54BX, -BXB, -X, 58, 58BX, -X, 59, 59BX, -X, 62, 62X, -XH, 64, 64X, -XH, 66, 66X, -XH, 68, 68X, -XH, 77, 77BX, -BXH, -X, -XH, where the suitability of the combination is determined by Underwriters' Laboratories, Inc.

Marking: Listee's name and basic model designation; Model 27 covering 27, 27B; Models 32, 33, 34, 35 covering all 32, 33, 34, and 35 models; Model 36 covering all 36 models; Model 37 covering all 37 models; Model 38 covering all 38 models; Models 39, 39B, -BX, -X, are marked Model 39; Models 40BX, -BXB, -X, are marked Model 40; Models 42, 42X, 53 covering all 42, 52, and 53 models; Model 54 covering Models 54BX, -BXB, -X; Model 58 covering Models 58BX, -X; Model 59 covering Models 59, 59BX, -X; Models 62, 64, 66, 68 covers 62 to 68XH incl.; and Model 77 covering all 77 models.

LIST OF MARKINGS

The following is a list of markings used for identifying devices listed under Reexamination Service where the accepted marking does not include the listee's name.

Having determined the listee's name, reference should be made to the group under which the device is classified to determine if the product is listed.

No markings appearing on the devices listed under the Label Service are included here since the label is evidence of compliance with the requirements of Underwriters' Laboratories, Inc.

"148"—Nageldinger & Son, Inc., John.
"A"—Werner Co., Inc., R. D.
"Airco"—Air Reduction Co., Inc.
"Aldek"—Werner Co., Inc., R. D.
"Craftsman"—Sears, Roebuck & Co.
"EMPEO"—Manometer-Fabrik Max Preiss.
"Ferro Jet"—National Cylinder Gas, Div. of Chemetron Corp.
"Gasweld"—General Dynamics Corp., Liquid Carbonic Div.
"Magic Seal"—Montgomery Ward & Co., Inc.
"Maid of Honor"—Sears, Roebuck & Co.
"NCG"—National Cylinder Gas, Div. of Chemetron Corp.
"Oceco"—Johnston & Jennings Co., The, Div. of Pettibone-Mulliken Corp., Oceco Div.
"Olof"—Thompson, Inc., O.
"Oxweld"—Linde Company, Division of Union Carbide Corporation.
"Powr-Kraft"—Mongomery Ward & Co., Inc.
"Prest-O-Lite"—Linde Company, Division of Union Carbide Corporation.
"Prest-O-Weld"—Linde Company, Division of Union Carbide Corporation.
"Purox"—Linde Company, Division of Union Carbide Corporation.
"Rego"—Bastian-Blessing Co., The.
"Russwin"—Russell & Erwin Div., The American Hardware Corp.
"SA770"—Chamberlain Corp.
"SLC"—Lamson & Sessions Co., The.
"Smith"—Steffens-Amberg Co., The.
"Trex Engineering Supply Co."—Nageldinger & Son, Inc., John.
"W"—Werner Co., Inc., R. D.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality or merit.

ITED CLOSE TO EDGE

Automotive Equipment List

Numbers following classification headings are the card file guide numbers. All appearing in this section are on brown colored cards.

This List covers those devices, materials, and systems which have been inspected and found suitable for use on automotive vehicles, either passenger or commercial types, or both.

The Gas and Oil Equipment List, Electrical Appliance and Utilization Equipment List, and Electrical Construction Materials List published by Underwriters' Laboratories, Inc. cover appliances and systems ordinarily employed in the construction of public and private garages, or used in connection with garages, filling stations, etc., including discharge devices, underground flammable liquid tanks, gasoline hose, and other similar devices. The Building Materials List covers building materials and equipment. The Fire Protection Equipment List covers many forms of fire extinguishers, fire alarm devices, and other products affecting the spread of fire and its extinguishment. Reference should be made to these Lists for detailed information.

For description of various Follow-Up Services of Underwriters' Laboratories, Inc., consult the Introductory section of this combined List.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality or merit.

CLEANING MACHINES—INTERNAL COMBUSTION ENGINE POWERED (60 C0)

The equipment covered in this section is internal combustion engine-powered, fueled with LP-Gas or gasoline.

The equipment is intended for commercial use and includes sweepers, scrubbers, and floor maintenance machines.

Fire hazard incident to use of fuel, electrical and exhaust systems have been investigated.

Equipment of this character is regarded as presenting inherent fire hazards which should be recognized. Storage and use of these machines should conform with requirements of authorities having jurisdiction.

For electrically powered cleaning machines see Electrical Appliance and Utilization Equipment List.

CLEANING MACHINES, TYPE G (60 C7)

These are gasoline engine powered cleaning machines having minimum acceptable safeguards against inherent fire hazards.

Reexamination Service

Clarke Floor Machine Co., Div. of Studebaker-Packard Corp., Muskegon, Mich.

Models PS-26C, -30G.
Marking: Listee's name, model designation, and "Type G."

Finnell System, Inc., Elkhart, Ind.

Models 215G-2, 218G, 418G.
Marking: Listee's name, model designation, and "Type G."

Tennant Co., G. H., Minneapolis 22, Minn.

Models 2KA, 39, 40, 50, 53, 75, 80, CR-A, G-A, KR-A.
Marking: Listee's name, model designation, and "Type G."

Wayne Mfg. Co., Pomona, Calif.

Models 705, 706.
Marking: Listee's name, model designation, and "Type G."

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Cleaning Machines—Internal Combustion Engine Powered—*Continued*

CLEANING MACHINES, TYPE LP (60 C12)

LOOK FOR THE LABEL

These are liquefied petroleum gas (LP-Gas) engine-powered trucks having minimum acceptable safeguards against inherent fire hazards.
Design of the fuel systems is based on provisions of Division IV of NBFU Pamphlet 58.
The LP cleaning machines listed under the Label Service of Underwriters' Laboratories, Inc. may be identified as illustrated.

Underwriters' Laboratories, Inc.
INSPECTED
POWER-OPERATED
CLEANING MACHINE
TYPE LP NO.——

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program. Inspection and tests at the factory include counter-check of design, construction, materials, assembly, and leakage tests of the fuel system.

Label Service

Clarke Floor Machine Co., Div. of Studebaker-Packard Corp., Muskegon, Mich.

Tennant Co., G. H., Minneapolis 22, Minn.

CONVERSION SYSTEM, LP-GAS (540 I0)

Beam Products Mfg. Co., Los Angeles 65, Calif.

LP-Gas conversion systems to convert from gasoline to LP-Gas fuel on the following Type G industrial lift trucks:
Yale & Towne Mfg. Co., Models KG51-30 to -100 with suffix letter "A," "AT," "P," "R," "S," or "T" in the designations.
Towmotor Corp., Models 420, 460, 480, 480P, 500, 500P.
Clark Equipment Co., "Carloader" Models 3024, 4024, 5024.
Hyster Co., Models HE-50, UE-30, YE-40, with or without suffix letter "T."
Listed by Report—The description of LP-Gas conversion systems and the recommended method of installation are contained in reports AU1662 dated March 31, 1958, April 1, 1958, April 2, 1958, and April 3, 1958, respectively, copies of which may be obtained upon application to the submittor or to Underwriters' Laboratories, Inc.

LP-Gas Equipment Corp., Franklin Park, Ill.

LP-Gas conversion system to convert from gasoline to LP-Gas fuel on Yale & Towne Mfg. Company Type G industrial lift trucks, Models KG51-30 to -100 incl., with additional letter "A," "AT," "T," "P," "R," or "S" in the designation. Models GC-, GCR-, GH-, GHR-, GP-, GPH-, GPHR-, GPR-, or GR- followed by suffix 52-2024, -3024, -4015, 52A-2024, -3024, -4015; 52T-2024, -3024, -4015, 52V-2024, -3024, -4015.
Listed by Report—The description of the LP-Gas conversion systems and the recommended method of installation are contained in reports Au1683 dated December 19, 1958 and October 21, 1960 copies of which may be obtained upon application to the submittor or to Underwriters' Laboratories, Inc.

Towmotor Corp., Cleveland 12, Ohio.

LP-Gas conversion system to convert from gasoline to LP-Gas fuel on Towmotor Corp., Type G industrial lift trucks, Models 420, 460, 480P, 500 and 500P.
Listed by Report—The description of this LP-Gas conversion system and the recommended method of installation are contained in a report Au1625 dated April 22, 1957 copies of which may be obtained upon application to the submittor or to Underwriters' Laboratories, Inc.

Yale & Towne Mfg. Co., Philadelphia 15, Pa.

LP-Gas conversion system to convert from gasoline to LP-Gas fuel on Yale & Towne Mfg. Company Type G industrial lift trucks, Models KG51-30 to -100, with additional letter "A," "AT," "T," "P," "R," or "S" in the designations.
Listed by Report—The description of LP-Gas conversion systems and the recommended method of installation are contained in reports Au1600 dated January 3, 1957 and April 24, 1957, copies of which may be obtained upon application to the submittor or o Underwriters' Laboratories, Inc.

DEFLECTORS, BACKFIRE (121 U0.4)

Subject to countercheck tests under automobile reexamination program.

Reexamination Service

AC Spark Plug Div., General Motors Corp., Flint 2, Mich.

"[illegible]" Air cleaners of the oil wetted and oil bath types consisting of steel shell containing a copper, steel, aluminum cactus, or cattle tail hair mesh filtering element; intended for use on internal combustion automobile engines; designed to prevent carburetor backfire flame.

TED CLOSE TO EDGE

Deflectors, Backfire—*Continued*

Air-Maze Div., Rockwell-Standard Corp., Cleveland 28, Ohio.

"Air-Maze." Screen-type air cleaner intended for use on internal combustion automobile engines, designed to diminish and deflect carburetor backfire flame.
Marking: Listee's name on name plate.

Donaldson Co., Inc., St. Paul, Minn.

Air cleaners of the oil bath type containing crimped screens or brass mesh cleaning element. Designed for use on gasoline and Diesel engines.
Marking: Manufacturer's name and address on decalcomania or brass plate on shell.

Harco Mfg. Co., Portland, Ore.

Models 20H1-8, 20H1-12, 30H-2, 35H2-4, 40H2-8, 42H2-10, 45H2-12, 50H-3, 55H-4, with or without additional letter P.
Marking: Listee's name and model designation.

Protectoseal Co., The, Chicago 8, Ill.

Nos. 925 and 950.
Marking: Listee's name and number designation.

Purolator Products, Inc., Rahway, N. J.

Part No. 61190 Type AF-47.
Marking: Listee's name, part, and/or type designation.

United Specialties Div., Novo Industrial Corp., Chicago 28, Ill.

Types H, CT, TI, TP.
Marking: Listee's name and type designation.

Vortox Co., Claremont, Calif.

"Vortox" air cleaners of oil-bath type, not exceeding 14-in. diameter, containing steel wire filtering elements. Designed for use on gasoline and Diesel engines.
Marking: Listee's name.

FILL AND VENT FITTINGS (120 I0)

Reexamination Service

Protectoseal Co., Chicago 8, Ill.

"Protectoseal" fill and vent fitting for automobile fuel tanks. Consists of cast-brass or cadmium-plated steel body, spring-closed brass or cadmium-plated steel cover, and two concentric perforated tubes which extend into fuel tank. Body threaded to fit fill spout on tank.
Marking: "Protectoseal" on cover.

FUEL FEED SYSTEMS (121 U0.8)

Reexamination Service

AC Spark Plug Div., General Motors Corp., Flint 2, Mich.

Electric-diaphragm type, Nos. 5594333, 5594461.
Mechanical type, Nos. 855085, -5156, -5235, -5405, -5480, -5751, -5829, -6139, -6239, 1521111, -1125, -1134, -1200, -1453, -1456, -1534, -1541, -1681, -1765, -1782, -1797, -1807, -1808, -1812, -2119, -2228, -2249, -3023, -3089, -3108, -3109, -3110, -3111, -3137, -3188, -3196, -3271, -3306, -3311, -3313, -3637, -3647, -3648, -3695, -3817, -3869, -3918, 1537060, -7083, -7341, -7383, -7914, -8274, -8313, -8412, -8449, -8638, -9042, -9047, -9052, -9055, -9074, -9090, -9119, -9126, -9139, -9142, -9143, -9217, -9282, -9285, -9294, -9326, -9352, -9358, -9371, -9421, -9493, -9543, -9549, -9552, -9570, -9571, -9579, -9585, -9590, -9597, -9604.
Marking: Trade name "AC" and last four digits of number designation.

Carter Carburetor Corp., St. Louis 7, Mo.

"Carter" electric motor actuated immersion type fuel pump for use on automotive vehicles with 6-v, 12-v, or 24-v electrical supply. Models P6008, P6018, P6028, P6088, P6048, and P6058.
Marking: Manufacturer's name, model number, and electrical rating on pump.

Eclipse Machine Div., Bendix Aviation Corp., Elmira, N. Y.

Electric type, Models 475951-53 incl., 476086-91 incl., 476117, -118, -120, -284, -409 to -414 incl., -439, -459, -477, -491, -502, -551, -717, -818, -830, -832, -842, -877, -926, -961, -979, -987, 477003, -036, -060, -119, -220, -223, -241, -288, -316, -326, -342, -546, -559, -646, -661, -672, -676, -680, -684, -699, -638, -641, -672, -684, -687, -787, -803, -870, -882, -923, -931, -934, -944, -974, -983, 478148, -162, -167, -186, -261, -360, -380, -456, -457, -575, -[illegible] -808, rated 6 v, 12 v, and 24 v, dc.
Marking: Listee's name and model designation.

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Fuel Feed Systems—*Continued*

Electric Autopulse Div., Walbro Corp., Cass City, Mich.

Electric type, Model 500; rated 6, 12, 24 v, dc.
Marking: Listee's name and model designation.

International Harvester Co., Motor Truck Div., Chicago 1, Ill.

Electric type, Model 218232-R91*.
*In tank type.
Marking: Listee's name and model designation.

Stewart-Warner Corp., Chicago 14, Ill.

Electro-magnetic type, Nos. 220A, 240-A6, -A12, -A24.
Marking: Listee's name and number designation.

Tokheim Corp., Fort Wayne 1, Ind.

Electric type, Models 552*, 552A*, 558*.
*In tank type.
Marking: Listee's name and model designation.

FUSES, AUTOMOBILE (100 L0.6)

Fuse of the glass tube type. For use in automotive circuits of not more than 25 v.

Reexamination Service

Atlas Supply Co., Newark 2, N. J.

Ampere ratings, 4, 6, 9, 14, 20, 30.
Marking: "Atlas," S.F.E., and ampere rating on ferrule.

Bussmann Mfg. Div., McGraw-Edison Co., St. Louis 7, Mo.

Ampere ratings, 4, 6, 9, 14, 20, 30.
Marking: "Buss," "S.F.E.," and ampere rating.

Littelfuse Incorporated, Des Plaines, Ill.

"Littelfuse" S.F.E. fuses. Ampere ratings: 4, 6, 9, 14, 20, 30.
Marking: "Littelfuse," S.F.E., and ampere rating on ferrule.

GAUGES

GASOLINE (ELECTRIC) (121 U0.10)

Reexamination Service

AC Spark Plug Div., General Motors Corp., Flint 2, Mich.

"AC." Electrically operated gasoline gauge of the dash-indicating type for use on automotive vehicles, Type C, Part Nos. 1517561, 1517603, 1517739, 1517761.
Marking: "AC" and type or part number stamped on cover plate.

Stewart-Warner Corp., Chicago 14, Ill.

Sending units, Model Nos. 383A, 390A, 507F for use with gauges, Model Nos. 358E, 365A, 379B, 505C.
Marking: Listee's name or initials "S.W." and model designation.

HEATERS (AUTOMOBILE) (165 E2)

COMBUSTION (165 E2.3)

LOOK FOR THE LABEL

Combustion type automobile heaters filed under the Label Service of Underwriters' Laboratories, Inc. may be identified by a label reading "Underwriters' Laboratories, Inc. Inspected Combustion Type Automobile Heater."
The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service program.

Label Service

[illegible]son Radiator, Div. of General Motors Corp., Lockport, N. Y.

[illegible] gasoline fueled, for commercial vehicles, minimum clearance to combustible [illegible] heater and exhaust.

NTED CLOSE TO EDGE

Heaters (Automobile)—Combustion—*Continued*

South Wind Div., Stewart-Warner Corp., Indianapolis 7, Ind.

Air heater, gasoline fueled, for commercial vehicles, minimum clearance to combustible material 1 in. from muffler and exhaust; coolant heater, gasoline fueled, for buses or trucks, minimum clearance to combustible construction 1 in. from heater and 3 in. from exhaust line. For use with nonflammable coolants only.

Wood Co., John, Heater & Tank Div., Conshohocken, Pa.

Combustion-type heaters, burning gasoline, for use in automotive trucks and trailers for preservation of perishable foodstuffs, or for comfort heating in commercial trucks and passenger buses.

Exhaust line shall be lagged within heated space and shall have not less than 1½ in. clearance from combustible materials outside heated compartment.

Hot-air ducts shall have not less than 1½ in. clearance from combustible material.

LP-GAS ACCESSORIES, AUTOMOTIVE TYPE (121 U0.12)

The following accessories are designed for use on LP-gas fueled automotive vehicles. Their use does not imply that the vehicle itself is listed. The listing indicates that the accessories are constructed and may be installed in accordance with the requirements of Division IV of NBFU Pamphlet 58.

Reexamination Service

Aeroquip Corp., Jackson, Mich.

"Aeroquip" fittings in ¼-, 5/16-, ⅜-, ½-, ⅝-, and ¾-in. sizes for use with "Aeroquip" flexible LP-Gas hose in factory assembly on vehicles employing LP-Gas as a fuel where the acceptability of the combination is determined by Underwriters' Laboratories, Inc.

Marking: Letter "A" with attached wing and letters "LPG" stamped on fitting.

Aeroquip Corp., Industrial Div., Van Wert, Ohio.

"Aeroquip" fittings in ¼-, 5/16-, ⅜-, ½-, ⅝-, ¾-in. sizes for use with flexible LP-Gas hose in factory assembly on vehicles employing LP-Gas as a fuel where the acceptability of the combination is determined by Underwriters' Laboratories, Inc.

Marking: Letter "A" with attached wing and letters "LPG" stamped on fitting.

Aeroquip Corp., Western Div., Burbank, Calif.

"Aeroquip" fittings in ¼-, 5/16-, ⅜-, ½-, ⅝-, and ¾-in. sizes for use with flexible LP-Gas hose in factory assembly on vehicles employing LP-Gas as a fuel where the acceptability of the combination is determined by Underwriters' Laboratories, Inc.

Marking: Letter "A" with attached wing and letters "LPG" stamped on fitting.

American Bosch Arma Corp., Hempstead, N. Y.

"Ensign" vaporizer-regulator assemblies. Automatic shut-off valve, and filter for use on LP-Gas fueled vehicles such as tractors, trucks, and buses. Filter, "Ensign," regulator, Model VP. Vaporizer-regulators, Models CVS, HL, NS, R, RW, S, VW, W. Automatic shut-off valve, Model J. Model CR carburetor regulator to be used in conjunction with Model CVS vaporizer-regulator. Low-pressure regulators, Models F, F1, and 1 in. Model B, where the suitability of the combination has been determined by Underwriters' Laboratories, Inc.

Marking: Listee's name, trade name, and model designation, and listee's name on filter.

American Liquid Gas Corp., Los Angeles 21, Calif.

Filters, Models 400, 550, 550S, 560, 670. Regulators, Models 1000-4, -5, for use with suitable low-pressure atmospheric type regulator (zero governor). Regulators, Models 60, 60S, 300E, -M, 605, 880, 1150, 1150E, 1290, 1290E. Vaporizer-regulators, Models C250, C250-1 for use with suitable low-pressure atmospheric type regulator (zero governor). Vaporizer-regulators, Models 1570, 1570A, -E, -EA, 1575, 1575A, -E, -EA, 1950E, -M, where the suitability of the combination is to be determined by Underwriters' Laboratories, Inc.

Marking: Listee's name or trade-mark "Algas" and model designation.

Anchor Coupling Co., Inc., Libertyville, Ill.

Flexible hose assemblies in ¼-, ⅜-, and ½-in. nominal sizes for automotive application employing LP-Gas as a fuel where the acceptability of the application has been determined by Underwriters' Laboratories, Inc.; Cat. Nos. 4LPG, 6LPG, 8LPG with suffix numbers and letters.

Marking: Listee's name, address, and catalog designation stamped in the ferrule coupling.

Bastian-Blessing Co., The, Chicago 46, Ill.

Quick-connect couplings, consisting of plug and socket. Plug, Part No. 7141M, Socket, Part No. 7141F.

These are quick-connect couplings for use at the fuel container on an LP-Gas fueled industrial lift trucks or tractors employing removable fuel containers. To be installed in accordance with Division IV of NBFU Pamphlet No. 58.

Filter-hydrostatic relief valve, No. 12747.

Marking: Listee's trade name "Rego" and part or number des[illegible]

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LP-Gas Accessories, Automotive Type—*Continued*

Beam Products Mfg. Co., Los Angeles 65, Calif.

Vaporizer-regulator assembly for use on LP-Gas fueled vehicles such as tractors, trucks, and buses.
Vaporizer-regulator, Model "Beam 120," "Beam 100," "Beam 60."
Marking: Listee's name and model designation.

Century Gas Equipment, Marvel-Schebler Products Div., Borg-Warner Corp., Decatur, Ill.

Filter, Century, Fuelock-Strainers, Models STF-020*, -1614. Strainers, Models NST-011, -1615. Vaporizer-regulators, Models H-1477, H-1477A, H-1645, H-1646A, H-2017, H-2018, H-2030, H-2044, H-2123, K-4, M-4, M4-O. Regulators, Models HV-199*, -2054, -2072.
*The model designation may have the letter "A" as suffix.
Marking: Listee's name and model designation on vaporizer-regulators, strainers, fuelock strainers, and listee's name on filter.

Controls Co. of America, A-P Sales Div., Milwaukee 45, Wis.

Trap-It strainer of the shell type for use on LP-Gas fueled vehicles. Model 408, Types A2, A3, B2, B3, B4, C3, C4, C5, A2F2F, A2F2M, A2M2M, A3-2M, B2F2F, B2F2M, B2M2M, B3-2M, -4M, C4M4M, C3-4M, C5-4M.
Marking: Listee's name or trade-mark, letters "AP" in a clock whee, and "CC," and model designation.

Equipment Mfg. Co., Inc., Gardena, Calif.

Vaporizer regulator, Model 300, where the acceptablity of the combination has been determined by Underwriters' Laboratories, Inc.
Marking: Listee's name and model designation.

Fisher Governor Co., Marshalltown, Iowa.

High-pressure regulator, Model L, Type 67-103 for use with a suitable low-pressure atmospheric type regulator (zero governor).
Marking: Listee's name and model designation.

Garretson Equipment Co., Inc., Mt. Pleasant, Iowa.

Immersion vaporizer, No. 11475. Control valve, No. 11459. Low-pressure regulators, Types FB, KN, Z (maximum inlet pressure 12 psig), Model S (maximum inlet pressure 5 psig), Model SD (maximum inlet pressure 10 psig) where the acceptability of the combination is to be determined by Underwriters' Laboratories, Inc. Vaporizer-regulator, Model K. Regulator, Model KV. For use on LP-Gas fueled vehicles such as tractors, trucks, and buses. Control valve to be assembled to immersion vaporizer and installed on fuel container.
Marking: "Garretson Carburetion System, Roswell, N. M." and type designation on regulator. Listee's name and number or model designation on others.

General Gas Corp., Baton Rouge, La.

Low-pressure regulator, Type FB. For use on LP-Gas fueled vehicles such as tractors, trucks, and buses. Control valve to be assembled to immersion vaporizer and installed on fuel container. Low-pressure regulator maximum inlet pressure 12 psig. Designed in compliance with Div. IV of NBFU Pamphlet No. 58.
Marking: Name and type designation.

Hansen Mfg. Co., The, Cleveland 11, Ohio.

Safety check connectors, consisting of plug and socket. Plug Nos. B1-K11, B2-K16, B3-K21, 2-GL-21. Socket Nos. B1-H11, B2-H16, B3-H21, 3-GR-16.
These are quick-connect couplings for use at the fuel container on LP-Gas fueled industrial lift trucks or tractors employing removable fuel containers. To be installed in accordance with Division IV of NBFU Pamphlet No. 58.
Marking: Listee's name and part number on the socket and on the plug.

J. & S. Carburetor Co., Dallas 2, Texas.

J & S vaporizer-regulator assemblies, regulators, and filters for use on LP-Gas fueled vehicles such as tractors, trucks, and buses. Vaporizer-regulators, Types B-1, -2, T-1, -2, 494-B1, 700, 725. Maximum inlet pressure, 250 psig. Low pressure regulators, Model 344, Maximum inlet pressure 15 psig. Models 600, 600MOD. Maximum inlet pressure, 12 psig. Model 625. Maximum inlet pressure 7 psig. Vaporizer-regulator assemblies, Types B-1-BR, -2-BR, T-1-BR, -2-BR. Maximum inlet pressure, 250 psig. Filters, Nos. 1, 302.
Marking: Listee's name and address, type or number designation, and maximum working pressure.

LP-Gas Equipment Corp., Franklin Park, Ill.

Filter, Model No. 711, where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc.
Marking: Listee's name and model designation.

Marvel-Schebler Products Div., Borg-Warner Corp., Decatur, Ill.

Vaporizer-regulator, Models UT725, -800. Filter, Model RFS.
Marking: Listee's name and model designation.

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LP-Gas Accessories, Automotive Type—*Continued*

National LPG Injectors, Inc., Lubbock, Texas.

Vaporizer regulators, Models M-½, M-1, low pressure shut-off valve, Model M-4, when the acceptability of the combination has been determined by Underwriters' Laboratories, Inc.
Marking: Listee's trade name and model designation.

Parker Fittings & Hose Div., A Div. of Parker Hannifin Corp., Cleveland 12, Ohio.

"Parker" fittings in sizes 4, 5, 6, 8, 10 and 12 for use with Parker LP-Gas hose 201UL or 221UL in sizes 3/16, ¼, 5/16, 13/32, ½, ⅝ in. I.D. in factory assemblies on vehicles employing LP-Gas as a fuel where the acceptability of the combination is determined by Underwriters' Laboratories, Inc.
Marking: Listee's trade-mark "P," fitting size, material symbols, and LPG roll-stamped on fittings.

Rochester Gauges, Inc. of Texas, Dallas 21, Texas.

Float-operated liquid-level gauges for use on LP-Gas fueled vehicles, such as tractors, trucks, and buses where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc., comprising sending units, Models 4120, 4123, 4180, 4181, 4183, 4184, and receiving unit, Model 4060, and direct reading units, Models 3180, 3181, 3183, 3184.
Marking: Listee's name and model designation.

Selwyn-Pacific Co., Los Angeles 61, Calif.

High-pressure regulator, Type 1605A and 1605HPA for use with a suitable low-pressure atmospheric type regulator (zero governor).
Marking: Listee's name and type designation.

Snap-Tite, Inc., Union City, Pa.

Quick-connect couplings, consisting of plug and socket. Plug Nos. VEN-2F, -2M, -4F, -4M, -6F, -6M, AVEN-2F, -2M, -4F, -4M, -6F, -6M, BVEN-2F, -2M, -4F, -4M, -6F, -6M. Socket Nos. VEC-2F, -2M, -4F, -4M, -6F, -6M, AVEC-2F, -2M, -4F, -4M, -6F, -6M, BVEC-2F, -2M, -4F, -4M, -6F, -6M.
These are quick-connect couplings for use at the fuel container on LP-Gas fueled industrial lift trucks or tractors employing removable fuel containers. To be installed in accordance with Division IV of NBFU Pamphlet No. 58.
Marking: Listee's name and part number.

Stratoflex, Inc., Ft. Worth 14, Texas.

"Stratoflex" brass fittings, Model Nos. SF319, 323, 324, 326, 330, 332, 421. Fitting sizes ¼, 5/16, ⅜, ½, ⅝ and ¾ in. are for use with flexible LP-Gas hose in factory assembly on vehicles employing LP-Gas as a fuel where the acceptability of the combination is determined by Underwriters' Laboratories, Inc.
Marking: Model designation with suffix and the trade-mark letter "S."

Taylor Mfg. Co., J. Y., Garland, Dallas County, Texas.

Float-operated liquid-level gauges for use on LP-Gas fueled vehicles such as tractors, trucks, and buses where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc., Gauge Nos. A2301, A2701.
Marking: Listee's name and number designation.

Thermo King Corp., Minneapolis 20, Minn.

Low-pressure regulator, Type FB (maximum inlet pressure 12 psig) where the acceptability of the combination is to be determined by Underwriters' Laboratories, Inc. Regulator, Model TK-57. For use on LP-Gas fueled vehicles such as tractors, trucks, and buses. Control valve to be assembled to immersion vaporizer and installed on fuel container.
Marking: Listee's name and type or model designation.

Tru-Flate, Inc., Oakland 3, Calif.

Quick connect couplings consisting of nipples, Part Nos. 61C-LPG, 61CA-LPG, 61CE-LPG, and couplers, Part Nos. 60C-LPG, 60CA-LPG, 60CE-LPG.
Marking: Listee's name and part designation.

Weatherhead Co., The, Fort Wayne, Ind.

"Weatherhead" fittings in ⅛-, 5/16-, ⅜-, ½-, ⅝-, and ¾-in. nominal sizes for use with LP-Gas hose in factory assembly on vehicles employing LP-Gas as a fuel where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc.; Socket Nos. 06904, 06905, 06906, 06908, 06910, 06912; Insert Nos. 102, 104, 106, 108, 112, 504, 505, 506, 508, 510, 512; Nut Nos. 404, 406, 408, 412, 604, 605, 606, 610, 612.
Marking: Manufacturer's trade-mark "W with arrow in a hexagon," and part numbers on sockets and on inserts or nuts.

Wiggins Oil Tool Co., Inc., The E. B., Los Angeles 23, Calif.

Quick connect couplings, consisting of plug and socket. Plug, Part Nos. BP or P-1802, P-1804, P-1806. Socket, Part Nos. BP or P-1801, P-1803, P-1805, P-1807.
Marking: Listee's name and part number on plug or socket.

LP-Gas Accessories, Automotive Type—*Continued*

Zenith Carburetor Div., The Bendix Corp., Detroit 14, Mich.

Filters, Part Nos. GF462, -462B, -483, -489. Vaporizer-regulators, Types A963B, *A964A*, *A964B*; Types A965A and A965D for use with water jacket housing Nos. 800-19A, 810-2 to -7 incl., -11, -12, -14, -14A, -23 to -31 incl., -34, -35; Types A965B for use with water jacket housing Nos. 810-2 to -7 incl., -11, -12, -35; Model A962A. Low-pressure regulators, Nos. 101, 102, *A806A*, *B806B*, B806D, where the acceptability of the combination has been determined by Underwriters' Laboratories, Inc. Vaporizer-regulator assemblies, Types *A800A*, *A800B*, *A815A*, *A815B*.
Marking: Listee's name, type, part, number, or model designation.

LP-GAS FUELED AUTOMOTIVE VEHICLES (245 P0)

The listing of these vehicles indicates compliance of the fuel system with the requirements of Division IV of NBFU Pamphlet 58. It also indicates that the fire hazards incident to the design and installation of the electric wiring and exhaust system have been reduced to an acceptable degree.

Reexamination Service

International Harvester Co., Chicago 1, Ill.

Road trucks incorporating fuel system designed for the use of liquefied petroleum gas as engine fuel. Models A and B with suffix numbers: -140 to -146 incl.; A, AC, B, BC with suffix numbers: -150 to -156 incl., -160 to -166 incl., -170 to -176 incl., -180 to -186 incl., -1896 incl.; ACF and BCF with suffix numbers: -170 to -176 incl., -180 to -186 incl.; RFP with suffix numbers: -170 to -176 incl., -190 to -196 incl., -210 to -216 incl., RP-185, -190 to -196 incl., -200 to -206 incl., -210 to -216 incl., V-195, V-200, V-210, V-212, V-220, VF-190, -200, -210, -214, VCO-195, -200, -220, VCOF-190, -200.
Farm tractors, Models Farmall 460L, 460LHC, 560L, 560LHC, International 560L, 460L Utility.
Marking: Listee's name and model designation.

International Harvester Co., Farm Implement Div., East Moline, Ill.

Combine incorporating fuel system designed for the use of liquefied petroleum gas as engine fuel, Nos. 101, 151, 181.
Marking: Listee's name and number designation.

John Deere Dubuque Tractor Works of Deere Manufacturing Co., Dubuque, Iowa.

Farm and road tractors, incorporating fuel system designed for use of liquefied petroleum gas as engine fuel, Models 430-CL, -SL, -TL, -UL, -WL.
Marking: Listee's name and model designation.

John Deere Harvester Works of Deere & Co., East Moline, Ill.

Combines, incorporating fuel systems designed for the use of liquefied petroleum gas as engine fuel, Series 45*, 55**, 95.
*Series designation may have suffix letter "R."
**Series designation may have suffix letters "B," "R," or "RB."
Marking: Listee's name and series designation.

John Deere Waterloo Tractor Works of Deere & Co., Waterloo, Iowa.

Farm and road tractors, incorporating fuel system designed for use of liquified petroleum gas as engine fuel, Models 3010LP, 4010LP.
Marking: Listee's name and model designation.

Massey-Ferguson, Inc., Detroit 32, Mich.

Farm and road tractor incorporating fuel system designed for use of liquefied petroleum gas as engine fuel, Models MF-50, -65, -85, -88.
Marking: Listee's name, model designation, and letter "B" as second letter of tractor serial number.

Oliver Corp., The, Charles City, Iowa.

Farm tractors, Models 770LPG, 880LPG, 1800LPG.
Marking: Listee's name and model designation.

Tractor & Implement Div., Ford Motor Co., Birmingham, Mich.

Farm and road tractors, incorporating fuel system designed for use of liquefied petroleum gas as engine fuel. Models 611, 621, 631, 641, 651, 661, 671, 681, 741-1, -3, -5, 771-1, -3, -5, 811, 821, 841, 851, 861, 871, 881, 941-1, -3, -5, 951-1, -3, -5, 961-1, -3, -5, 971-1, -3, -5, 981-1, -3, -5, 20301-L to 20306-L incl., 40301-L, 40303-L, 40304-L, 40305-L, 40306-L.
Marking: Listee's name, model designation, and suffix letter "L" in tractor serial number.

MUFFLERS FOR AUTOMOBILES (260 U0)

Mufflers listed by Underwriters' Laboratories, Inc. are tested only for ability to resist rupture due to severe exhaust line explosions.

Reexamination Service

TED CLOSE TO EDGE

Mufflers for Automobiles—*Continued*

Atlas Trailers & Water Mufflers, Inc., Houston 2, Texas.

Model Nos. 50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600.
Marking: "Atlas" and model designation.

International Parts Corp., Chicago 32, Ill.

Part Nos. 201-07 incl., 210, 211, 218, 224, 225, 228, 344, 357, 360, 384, 394, 396, 399, 400, 419, 430, 435, 439, 444, 447, 460, 461, 462, 466, 467, 468, 471-79 incl., 483-89 incl., 492-99 incl., 510, 512-15 incl., 522, 528, 529, 536, 537, 539, 575, 576, 611-14 incl., 616, 619, 620, 625-28 incl., 632, 638-41 incl., 646, 647, 658, 660, 661, 669, 670, 674, 775-83 incl., 785, 786, 792, 794-97 incl., 2000, 2001, 2002, 2005-12 incl., 2018-24 incl., 2026, 2027, 2028, 2100-04 incl., 2201-04 incl., 2207, 2300, 2400, 2402, 2403, 2408, 2418, 2419, 2420, 2424-29 incl., 2432-38 incl., 2443, 2444, 2446, 2448, 2450-53 incl., 2456-61 incl., 2467-71 incl., 2474, 2602-06 incl., 2613, 2614, 2616-20 incl., 2623, 2625, 2627, 2800, 2802, 2803, 2805, 2807-13 incl., 3000, 3001, 3004-09 incl., 3100-07 incl., 3109-14 incl., 3200-05 incl., 3207-13 incl., 3300-04 incl., 3400-06 incl., 3408, 3410, 3411, 3502, 3600-06 incl., 3609, 3610, 3613, 3614, 3900, 4000-05 incl. Part numbers have prefix C, H, or M followed by 1, 2, 3, 4, 5, 6, 7, 8, 9, or 0 and A, B, C, D, E, F, G, H, I, J, K, or L and with or without suffix M.
Marking: Listee's name or "International" and part designation.

Midas, Inc., Chicago 32, Ill.

Part Nos. 201-07 incl., 210, 211, 218, 224, 225, 228, 344, 357, 360, 384, 394, 396, 399, 400, 419, 430, 435, 439, 444, 447, 460, 461, 462, 466, 467, 468, 471-79 incl., 483-89 incl., 492-99 incl., 510, 512-15 incl., 522, 528, 529, 536, 537, 539, 575, 576, 611-14 incl., 616, 619, 620, 625-28 incl., 632, 638-41 incl., 646, 647, 658, 660, 661, 669, 670, 674, 775-83 incl., 785, 786, 792, 794-97 incl., 2000, 2001, 2002, 2005-12 incl., 2018-24 incl., 2026, 2027, 2028, 2100-04 incl., 2201-04 incl., 2207, 2300, 2400, 2402, 2403, 2408, 2418, 2419, 2420, 2424-29 incl., 2432-38 incl., 2443, 2444, 2446, 2448, 2450-53 incl., 2456-61 incl., 2467-71 incl., 2474, 2602-06 incl., 2613, 2614, 2616-20 incl., 2623, 2625, 2627, 2800, 2802, 2803, 2805, 2807-13 incl., 3000, 3001, 3004-09 incl., 3100-07 incl., 3109-14 incl., 3200-05 incl., 3207-13 incl., 3300-04 incl., 3400-06 incl., 3408, 3410, 3411, 3502, 3600-06 incl., 3609, 3610, 3613, 3614, 3900, 4000-05 incl. Part numbers have prefix C, H, or M followed by 1, 2, 3, 4, 5, 6, 7, 8, 9, or 0 and A, B, C, D, E, F, G, H, I, J, K, or L and with or without suffix M.
Marking: Listee's name and trade name.

SIGNALS AND SIGNALING APPLIANCES (380 I9)

HIGHWAY EMERGENCY SIGNAL (380 I9.8I)

Highway emergency signals include the following types:
Liquid-Burning Flare—A wick-operated, open-flame torch designed for use with liquid fuel having a fire-hazard classification not greater than that of kerosene.
Red Electric Lantern—A dry-cell-operated electric lantern with a dome which imparts a red color to the light.
Fusee—A dry, chemical flare burning with open, red flame.
Reflector—A signal incorporating reflecting discs or lenses which impart red color to light reflected from headlamps of approaching vehicle.

Reexamination Service

American Railway Signal Co., The, Fostoria, Ohio.

"American," 5, 10, 15, and 20 min. fusees.
Marking: Listee's name, trade name and time of burning.

Delbar Products, Inc., Perkasie, Pa.

"Delbar" highway emergency signals of reflector types. Model Nos. 333-F, 336-F.
Marking: Trade name, name of listee, and model designation.

Dietz Co., R. E., Syracuse 1, N. Y.

"Dietz" highway emergency signal of reflector type for warning approaching traffic of stalled motor vehicle, Model No. 321.
Marking: Listee's name and model designation.

Emarco Corp., Dayton 14, Ohio.

"Thoro-Flare," Models A and AW electric lanterns for use as a signal in warning approaching traffic of stalled motor vehicles.
Marking: Listee's name, trade name, and model designation.

Falcon Alarm Co., Inc., Summit, N. J.

"Falcon Marine Distress Signal" 10, 15, 20, and 30 minute burning fusees.
Marking: Listee's name, address, trade name "Falcon Marine Distress Flares," and burning time.

Griffin Lamp Co., The, Hamilton, Ohio.

"Griffin Model No. 4" highway emergency signals of reflector type for warning approaching traffic of stalled automotive vehicle.
Marking: Listee's name, trade name, and model designation.

Grote Mfg. Co., The, Madison, Ind.

"Grote" kerosene flare, Model No. 90.
Marking: Listee's name and model designation.

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Signals and Signaling Appliances—Highway Emergency Signal—*Continued*

Harvell-Kilgore Corp., City of Commerce, Los Angeles 22, Calif.

"International," 5-, 10-, 15-, 20-, and 30-min burning fusees.
Marking: Listee's name, trade name, and burning time.

International Harvester Co., Chicago 1, Ill.

"I. H. Reflector Flare," "I. H. Reflector Flare 996 961 R91" highway emergency signals of reflector type for warning approaching traffic of stalled vehicle.
Marking: Trade name and name of listee.

Jackson Fusee Co., Samuel, Easton, Md.

"Protectolite" 20 and 30 min. burning fusees.
Marking: Listee's name, address, trade name, and burning time.

Miro-Flex Co., Inc., The, Wichita 7, Kan.

"Miro-Flare" highway emergency signal of reflector type, Models No. 18 and 20.
Marking: Name and address of listee and model designation.

Norlipp Co., Chicago 21, Ill.

"Norlipp Reflector Flare #1000" highway emergency signal of reflector type. Made in one model only.
Marking: Listee's name and trade name.

Speaker Corp., J. W., Milwaukee 12, Wis.

Reflectors, #210 Reflector Flare, "214-RF Flare Kit.
Marking: Listee's name and trade name.

Standard Railway Fusee Corp., Boonton, N. J.

"Standard" 10, 15, 20, and 30 minute burning fusees.
Marking: Listee's name, address, trade name "Standard," and burning time.

Toledo Pressed Steel Co., The, Toledo, Ohio.

"Toledo" kerosene flare. Models 3 and 5.
Marking: Model designation and name and address of manufacturer.

Turnsignal Corp., Philadelphia 21, Pa.

"Turnco Flare" electric flare.
Marking: Listee's name and trade name.

Vari-Products Co., Chicago 16, Ill.

"Vari-Flare" highway emergency signals of reflector type. Models F, G.
Marking: Trade name, name of listee, and model designation.

Wilco Distributing Co., Needham Heights, Mass.

"Wilco Distress Flares" 10, 15, 20, and 30 minute burning fusees.
Marking: Listee's name, address, trade name "Wilco Distress Flares," and burning time.

SWITCHES (100 L0.19)

Reexamination Service

American Bosch Arma Corp., Hempstead, N. Y.

Vacuum type, Model SF.
Marking: Listee's name, "Ensign," and model designation.

American-Standard Controls Div., Rochester Instrument Plant, Rochester 10, N. Y.

Manual disconnect type, Model 2835-C1.
Marking: Listee's name and model designation.

Beam Products Mfg. Co., Los Angeles 65, Calif.

Vacuum type, Model 1501.
Marking: Listee's name and model designation.

Cole-Hersee Co., South Boston 27, Mass.

Cat. No. 2484. Manual switch, wired in battery circuit, designed to disconnect battery from electrical circuits of automotive vehicles employing 6- or 12-v battery.
Marking: Listee's name, model designation, and electrical rating.

TED CLOSE TO EDGE

Switches—*Continued*

Gann Products Co., South Gate, Calif.

Vacuum type, Model 1501.
Marking: Listee's name and model designation.

Hobbs Corp., John W., Div. of Stewart-Warner Corp., Springfield, Ill.

Oil pressure type, Models MI-1372, -1373, -2171, -2405.
Marking: Listee's name and model designation.

LP-Gas Equipment Corp., Franklin Park, Ill.

Vacuum type, Models 140-1, -10.
Marking: Listee's name and model designation.

McQuay-Norris Mfg. Co., St. Louis 9, Mo.

Vacuum type, Models 140-1, -10.
Marking: Listee's name and model designation.

Marvel-Schebler Products Div., Borg-Warner Corp., Decatur, Ill.

Vacuum type, Model 175-8.
Marking: Listee's name and model designation.

Melmick Industries, Inc., Winston-Salem, N. C.

"Fyre-Blok" automatic turnover switch for use in 6-48 volt battery-operated vehicle ignition systems.
Marking: Listee's name, designation, and electrical rating.

Rogers Development Corp., A. L., Seaford, N. Y.

Manual disconnect type, Types S-1011, S-1012.
Marking: Listee's name and type designation.

TANKS, AUTOMOTIVE FUEL (121 U0.20)

LOOK FOR THE LABEL

Automotive fuel tanks are metal containers intended to be mounted outside the frame or in other exposed locations on gasoline or Diesel engine powered trucks, tractors, or trailers. They are of welded, brazed, or silver-soldered construction.

They are provided with fill fittings; gauge (optional), fill and nonspill vent openings; and fusible plug type relief device, all of which have their exit from the top part of the tank above the maximum filling level.

Automotive fuel tanks are listed under the Label Service of Underwriters' Laboratories, Inc.

Each listed device of this class bears a combination label containing the manufacturer's name or trade-mark, together with other required or appropriate information, and the inspection manifest as illustrated:

Underwriters' Laboratories, Inc.®
INSPECTED
AUTOMOTIVE FUEL TANK
No. [redacted]

The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program. Inspections and tests at the factory include countercheck of dimensions, materials and construction, and tests for leakage. In addition, countercheck tests on the relief devices are conducted at the Chicago Office.

Label Service

Aluminum Co. of America, Cooking Utensil Div., New Kensington, Pa.

Cylindrical type.

American Safety Tank Co., Kansas City 2, Mo.

Cylindrical type.

Arrow Mfg. & Sales Co., White Pigeon, Mich.

Saddle and cylindrical types.

Briskin Mfg. Co., Chicago 23, Ill.

Rectangular step type, rectangular type, cylindrical type.

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Tanks, Automotive Fuel—*Continued*

Cutler Metal Products Co., Camden, N. J.

Saddle, cylindrical and rectangular types.

Fontaine Truck Equipment Co., Inc., Birmingham 1, Ala.

Cylindrical type and rectangular step-type.

International Harvester Co., Motor Truck Div., Fort Wayne 1, Ind.

Rectangular-step type.

Mack Mfg. Corp., Allentown, Pa.

Cylindrical and saddle types.

Master Tank & Welding, Dallas, Texas.

Cylindrical, rounded-rectangular, rectangular step, and saddle types.

Michigan Fleet Equipment Co., Grand Rapids 9, Mich.

Cylindrical type, saddle type, rectangular type, rectangular end step type, obround type.

Perkins Welding Corp., Buffalo 3, N. Y.

Cylindrical type, saddle type.

Prior Products, Inc., Dallas 10, Texas.

Cylindrical, obround, saddle, rectangular and semi-saddle types.

Riverside Tank & Mfg. Corp., St. Clair, Mich.

Cylindrical, obround, and saddle types.

Snyder Tank Corp., Buffalo 5, N. Y.

Saddle, cylindrical, rectangular, and rectangular step-type.

TRUCKS, INDUSTRIAL (400 R0)

Industrial type material handling equipment covered in this section is of the power-operated, riding or walking type, such as lift trucks, platform trucks, towing tractors, etc.

These devices may be electric battery-powered or internal combustion engine-powered.

ELECTRIC, BATTERY-POWERED (400 R3)

Listing of the following battery-operated electric industrial trucks signifies that the fire hazard incident to their use in ordinary locations, has been reduced to an acceptable degree. No tests have been conducted to determine their suitability for use in hazardous locations as defined by the National Electrical Code.

Electric battery-powered industrial trucks are designated Type E or EE.

Trucks, Industrial, Type E (400 R3.5)

The electric battery-powered trucks covered in this section have minimum acceptable safeguards against fire hazards.

Various types and models of electric industrial trucks listed in this section are designed for operation with either storage batteries or gasoline-engine-electric power units as the source of power. Electric industrial trucks listed below, if operated by listed gasoline-engine-electric power units, may be considered as listed under the caption "Internal Combustion Engine-Powered Type G." Gasoline-engine-electric powered industrial trucks are regarded as presenting inherent fire hazards which should be recognized. Storage and use of these trucks should conform with requirements of authorities having jurisdiction.

Fire hazards incident to use of fuel, electrical and exhaust systems of trucks equipped with gasoline-engine-electric power units have been investigated.

Trucks suitable for use with gasoline-engine-electric power units are specifically indicated by an asterisk (*) in the individual listings.

Reexamination Service

Automatic Transportation Co., Chicago 20, Ill.

Models BF15*, -20*, -20S*, -30*, -40*, CLA, CLB, CLTA, CLTB, CR, CXA, CXB, CXTA, CXTB, FF10* to -15* incl., MT, P, PE, PR, PRE, RNN*, RNT*, RTN*, RTT, SCL, SCLH, SCLT, SCLTH, SCX, SCXH, SO, SOT, SPH, SPL, SPLL, SS, SST, TBE, TESO, TET, TETH, TETT, THSE, TN, TNE, TR, TRH, TRL, TRLE, TRLH, TSE, TSHE, TW, TWE, TWHE; Models UT-2, -4, WA, WAL, WAT, WC, WH, WHL, WLT, WN, WN-F, WNY, WO, WOAT, WOT, WP, WPR, WPY, WS, WSA, -2B, -4A, -4B, WTB, WTB-F, WTWA, WW, WWF, WWH, WWHY, WWS, WX, WXF, WXY, with or without additional suffix numerals.

Any [illegible] and model designation.

TED CLOSE TO EDGE

Trucks, Industrial—Electric, Battery-Powered—Type E—Continued

Baker Industrial Trucks, A Div. of Otis Elevator Co., Cleveland 2, Ohio.

Model Nos. FTA-030-003, -050-003, -070-003, FTD-020-004, -030-009, -040-006, -050-006, -060-004.
Marking: Listee's name, model designation and Type E.

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Model Nos. EC-20, -20B, ECE-1524*, -2015*, -2024*, ECK-24*, -30*, ECL-4024*, -5024*, ECL-D-4024*, -5024*, ECR-3024*, ECS-4024*, ESW-2024*, ETR-1024*, -B-1024*, ETT-100*, -6024*, -7024*, -8024*. Models 4024LF-4096LP incl., 4024P-4096P incl., 6024LP-6096LP incl., 6024P-6096P incl., with additional suffixes. Models 2T-12, 15TF, 20TF, 25TF, 30TF, 15TTF, 20TTF, 25TTF, 30TTF.
Marking: Listee's name, model designation, and Type E.

Elwell-Parker Electric Co., The, Cleveland 3, Ohio.

Type Nos. C4*, CU*, CX4*, CZ*, DG*, DH*, DK*, E2*, E11*, ELB30*, -40*, -50*, -54*, ELN6*, -6DP*, -8*, -10*, -10DP*, -12*, -16*, -20*, -30*, -40*, -50*, EP4*, EP4-11, EP6*, -6C*, -8*, -10*, -10C*, EQ3*, -4*, ERS3*, ERX6*, -7*, ERSP*, EW4*, -6*, -6C*, EY20*, F5*, F6*, F10*, F10* Scoop, F11*, F13*, F14*, F15*, F19*, F22*, F23*, F24, F24LP*, F25*, F28*, FH4*, -6*, IE*, IE* Wrench, IZ4*, -8*, L3*, L12*, L13*, LF6*, LP*, LQ8*, RA4*, -6*, -8*, -10*, -12*, -16*, -20*, SE*, T2*, T3*, TQ*, WH4*, -6*, -6C*. (Type numbers may have suffixes LK or T). Type Nos. F26T2*, -T3*, F30T3*, -T4*, -T5*, F31T6*, -T7*, with or without suffix letters C, LK, PR, RC, and RF. Type Nos. F40T5*, -T4*, with or without suffix letters C, LK, PR, RC, and RF with or without additional suffix letter T.
Marking: Listee's name and type designation.

Lewis-Shepard Co., Watertown, Mass.

Model Nos. EFT-1, EFTT-1, EFFTT-1, EFT-59, EFTT-59, EFFTT-59, EFT-2S, EFTT-2S, EFFTT-2S, EFT-2, EFTT-2, EFFTT-2, EFT-Multi, EFTT-Multi, EFFTT-Multi, EFT-2.5, EFTT-2.5, EFFTT-2.5, EFT-61, EFTT-61, EFFTT-61, EFT-3, EFTT-3, EFFTT-3, EFT-3H, EFTT-3H, EFFTT-3H, EFT-4S, EFTT-4S, EFFTT-4S, EFT-4, EFTT-4, EFFTT-4, EFT-4H, EFTT-4H, EFFTT-4H.
Marking: Listee's name, model designation, and Type E.

Mercury Mfg. Co., The, A Subsidiary of Pettibone Mulliken Corp., Chicago 51, Ill.

Model A-550*.
Marking: Listee's name, type, model designation, and rating.

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

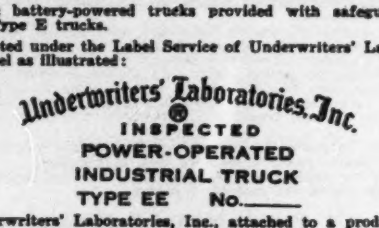
Models K51A, K51T, K51AT, K51TL, with suffixes 10, 15, 20, 30, 30X, 40, 50, 60, 70, 80, and 100; K53A, K53T, K53AT with suffixes 20 and 30. Model Nos. K58, K58T, K58LT, KL58, KL58T, KL58LT, with suffixes 15, 20, 25 and 30, suffix number 24, and suffix numbers 59-118. Models MT, MTR, MSGT, M4P, M6P, M4TP, M4, M6, M25HLP, M4HL, M5HL, M6HL, M10HF, M15HF, M4HLF, M15HTF, M20HTF, M25HTF, M30HTF, M15ATF, M20ATF, M25ATF, M30ATF, M10TF, M15TTF, M20TTF, M25TTF, M30TTF, M30HLT, M40HLT, M30HLTP, M40HLTP, M40HLB, M4U, M6U, MS4P, MS6P, MS4, MS6, M10AF, M15AF, M20AF, M25AF, M30AF, M10ATE, M30SF, M30STF, M40P, M40P, MM40P, MM60P, ML40P, ML60P, M40, M60, MM40, MM60, ML40, ML60.
Model RB with suffix letters F or E, suffix numbers 20, 30, or 40, suffix letters S, M, L or X, suffix number 24, suffix letters S, D, or T and suffix numbers 053-096.
Marking: Listee's name and model designation, and Type E.

Trucks, Industrial, Type EE (400 R3.6)

LOOK FOR THE LABEL

These are electric battery-powered trucks provided with safeguards in addition to those required for Type E trucks.

Type EE trucks listed under the Label Service of Underwriters' Laboratories, Inc. may be identified by a label as illustrated:



The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Automatic Transportation Co., Chicago 20, Ill.

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Lewis-Shepard Co., Watertown, Mass.

COPY PRINTED

Trucks, Industrial—Electric, Battery-Powered—Type EE—*Continued*

Mercury Mfg. Co., The, A Subsidiary of Pettibone Mulliken Corp., Chicago 51, Ill.

Moto-Truc Co., The, Cleveland 8, Ohio.

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

INTERNAL COMBUSTION ENGINE-POWERED (400 R5)

These industrial trucks are regarded as presenting inherent fire hazards which should be recognized. Storage and use of these trucks should conform with requirements of authorities having jurisdiction.

Fire hazards incident to use of fuel, electrical, and exhaust systems have been investigated.

See listings under caption "Electric Battery-Powered—Type E" for trucks capable of being operated either by storage batteries or gasoline-engine-electric power units.

Internal combustion engine-powered industrial trucks are classified as Types D, DS, G, GS, LP, LPS.

Trucks, Industrial, Type D (400 R5.4)

These are diesel engine-powered trucks having minimum acceptable safeguards against inherent fire hazards.

Reexamination Service

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Models FD30-24, FD40-24, FD50-24, with or without suffix letter PS; FD60-24, FD70-24, FD80-24, FSD60-24, FSD70-24, FSD80-24, with or without suffix letters PS, 2PS; FD100-24, -24-2PS; FTD30-15, -24, FTD40-18, -20, -24, FTD50-24, FTD60-24, FTD70-24, FTD80-24, FTD100-24, FTDB50-24, FTDOH60-24, FTDS60-24, FTPD30-24, FTPD40-24, FTPD60-24, HAD-75, -90, -120, HBD-75, -90, -120, TD-24, -30, with or without suffix letters C, PS, 2C, or 2PS.
Marking: Listee's name, model designation and "Type D."

Hyster Co., Portland 8, Ore.

Models RC-150D, -160D, SC-180D, TC-200D.
Marking: Listee's name, model designation, and "Type D."

Towmotor Corp., Cleveland 12, Ohio.

Models 481D, L481D, 501D, -PD, L501PD, 540D, 600D, -PD, 670D, 680PD.
Marking: Listee's name, model designation and "Type D."

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

Models KD51-, KDP51-, KDS51- followed by suffix letters A, AT, or T, and numbers 40, 50, 60, 60H, 70, 80, or 100 followed by letters U or UF.
Marking: Listee's name, model designation and "Type D."

Trucks, Industrial, Type DS (400 R5.5)

LOOK FOR THE LABEL

These are diesel engine-powered trucks which are judged under requirements similar to those applying to Type D trucks. Special features are provided as additional safeguards to further reduce the inherent fire hazards of the electrical, fuel, and exhaust systems.

Type DS trucks listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label as illustrated:

Underwriters' Laboratories, Inc.®
INSPECTED
POWER-OPERATED
INDUSTRIAL TRUCK
TYPE DS No.———

The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Towmotor Corp., Cleveland 12, Ohio.

TED CLOSE TO EDGE

Trucks, Industrial—Internal Combustion Engine-Powered—Continued

Trucks, Industrial, Type G (400 R5.7)

These are gasoline engine-powered trucks having minimum acceptable safeguards against inherent fire hazards.

Reexamination Service

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Models F30-24, F40-24, F50-24, with or without suffix letters PS; F60-24, F70-24, F80-24, with or without suffix letters PS or 2PS; F100-24, -24-2PS; CB-20, FB20-15, -24, FPB20-15, -24, FT20-24, FT30-15, -24, FT40-15, -20, -24, FT50-24, FT60-24, FT70-24, FT80-24, FT100-24, FTB30-15, FTB50-24, FTOH60-24, FTP20-24, FTP30-24, FTS50-24, FTS70-24, FTP40-24, FTP60-24, HA-75, -90, -120, HB75, -90, -120, TG-24, -30, with or without suffix letters C, PS, 2C, or 2PS; FS60-24, FS70-24, FS80-24, with or without suffix letters PS or 2PS.
Marking: Listee's name, model designation and "Type G."

Automatic Transportation Co., Chicago 20, Ill.

Models GLF-30, -40, -50, -60, -70, -80, -90, -100, GLFW-70, -80, -90, -100.
Marking: Listee's name, model designation and "Type G."

Baker Industrial Trucks, A Div. of Otis Elevator Co., Cleveland 2, Ohio.

Models FGA-030-002, -050-002, -070-001, -070-002, FGD-020-002, -030-003, -040-001, -040-002, -050-001, -050-002, -060-001, -060-002, FGF-020-002, -030-002, -040-002, FJA-050-001, -070-002, FJD-030-001, -040-001, -050-001, -060-001, FJF-030-001, -040-001.
Marking: Listee's name, model designation and "Type G."

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Models C20-B, -P, -SU, C25-B, -SU, C30-B, C40-B, C50-B, CE-C, CF-30-B, -40-B, -50-B, CK-20, -26, CL-D30, -D40, -D40-S, -D50, CT-21, -80, -120, CY-20-B, -30-B, -40-B, -50-B, -60, -70, -80, -150, -165, -180L, -180S, -200, CFY20-B, -30-B, -40-B, -50-B, -60, -70, -80, -150, -165, -180L, -180S, -200, CKT-5-B, FCT-30, -40, -60, HUT-F60, -F70, -F80, -E100, HUTS-F70, -F80, -E100, TR-B, UT-F60, -F70, -F80, -E100, UTS-E100, Y-20B, -40C, -60C.
Marking: Listee's name, model designation, and "Type G."

Elwell-Parker Electric Co., The, Cleveland 3, Ohio.

Models GEP-6, GEP-10, GEP-12, GEP-16.
Marking: Listee's name, model designation and "Type G."

Gerlinger Carrier Co., Dallas, Ore.

Models A-10, -12, -15, -16, -18, -20, -22, -24, H-32, -36, -40, -45, L-12, -15, -16, -18, -20, -22, LH-40, 12RH, 15RH.
Marking: Listee's name and model designation and "Type G."

Hough Co., The Frank G., Libertyville, Ill.

Models H-25, HA.
Marking: Listee's name, model designation and Type "G."

Hyster Co., Portland 8, Ore.

Models BC, BT, H20E, H25E, H60B, H70B, H80B, H100B, H120B, HE-50, -40T, KB, QC-20, RC-150, -160, S20A, S25A, S30B, S40B, S50B, S60B, S70B, S80B, S100B, SC100, TC-200, UE-30, -30T, YE-40, -40T.
Marking: Listee's name, model designation, and "Type G."

Kalamazoo Mfg. Co., Kalamazoo 24F, Mich.

Models 101, 201, 202, 301, 303, 304, 2500, 3600.
Marking: Listee's name, model designation and Type "G."

Mercury Mfg. Co., The, A Subsidiary of Pettibone Mulliken Corp., Chicago 51, Ill.

Model 460, Type "Banty." Models A3000G, A3000GT, A4000G, A4000GT, A5000G, A5000GT, A6000GTC, A7000GTC.
Marking: Listee's name, type or model designation, and "Type G."

Motec Industries, Inc., Hopkins, Minn.

Models B-224, D-424-A, E, EW, H, HW, L-524-A, M-324.
Marking: Listee's name, model designation, and Type "G."

Prime Mover Co., The, Muscatine, Iowa.

Model F-10-G.
Marking: Listee's name, model designation, and "Type G."

Ready-Power Co., The, Detroit 8, Mich.

Gasoline-engine-electric power units, Models DB, MBA, FAM, FAS, EAMS, EGM, EHM, HA, HC, L, L2, 15G, F, H, I, O, P, R, S, Z. Supplied for 12, 15, 27, 30, 36, 48, 60 or 72 volts.
Marking: Listee's name, model designation, and "Type G."

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Trucks, Industrial—Internal Combustion Engine-Powered—Type G—*Continued*

Towmotor Corp., Cleveland 12, Ohio.

Models K-5, 350, 391, 400P, 410, 421, 440, 461, L461, 501, 501P, L501P, 540, 590, 600, 600P, 670, 680P, 900, with or without suffix letters "RS."
Marking: Listee's name, model designation, and "Type G."

Transitier Truck Co., A Subsidiary of Pettibone Mulliken Corp., Swan Island, Portland 11, Ore.

Models G-15, G-20A, G-20B, G-25, G-30, G-5840, GA-30H, -40, -40H.
Marking: Listee's name, model designation and "Type G."

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

Models G5-150, -165, -180, -200, Models GC-, GCR-, GH-, GHR-, GP-, GPH-, GPHR-, GPR, or GR-, followed by suffix 52-2024, -3024, -4015, 52A-2024, -3024, -4015, 52T-2024, -3024, -4015, 52V-2024, -3024, or -4015. Models G54C- followed by numbers 030-, 040- or 050- and letters NAS, NAD, NAT, NBS, NBD or NBT with suffix letters U or UF. Models G64P- followed by numbers 030-, 040-, or 050- and letters CAS, CAD, CAT, CBS, CBD or CBT with suffix letters U or UF. Models KG51-, KGA51-, KGP51-, KGPA51-, KGPR51-, KGR51-, KGS51-, KGSA51-, or KGSR51-, followed by suffix letter A, AT, ATJ, T, or TJ and numbers 10, 15, 20H, 20L, 30, 30X, 40, 50, 60, 70, 80, or 100 followed by letters U or UF. Models G3P-150, -165, -180 or -200 followed by suffix letters CAS, CFS, CRS, FAS, FFS, or FRS, followed by letters U or UF.
Model Y18P-25- followed by letters CR-, CF- or CA- and letters A, B, C, D, E, R or S with suffix letters U or UF. Models G10P-30, -40, -50, -60 followed by letters CR-, CF-, or CA- with suffix letters UF.
Marking: Listee's name, model designation and "Type G."

Trucks, Industrial, Type GS (400 R5.8)

LOOK FOR THE LABEL

These are gasoline engine-powered trucks with fuel, electrical, and exhaust systems provided with safeguards in addition to those required for Type G trucks.

Type GS trucks listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label as illustrated:

Underwriters' Laboratories, Inc.®
INSPECTED
POWER-OPERATED
INDUSTRIAL TRUCK
TYPE GS No.——

The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Hyster Co., Portland 8, Ore.

Towmotor Corp., Cleveland 12, Ohio.

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

Trucks, Industrial, Type LP (400 R5.12)

LOOK FOR THE LABEL

These are liquefied petroleum gas (LP-Gas) engine-powered trucks having minimum acceptable safeguards against inherent fire hazards.

Design of the fuel systems is based on the provisions of Division IV of NBFU Pamphlet 58.

Type LP trucks listed under the Label Service of Underwriters' Laboratories, Inc. may be identified by a label as illustrated:

Underwriters' Laboratories, Inc.®
INSPECTED
POWER-OPERATED
INDUSTRIAL TRUCK
TYPE LP NO.——

The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

TED CLOSE TO EDGE

Trucks, Industrial—Internal Combustion Engine-Powered—Type LP—*Continued*

Automatic Transportation Co., Chicago 20, Ill.

Baker Industrial Trucks, A Div. of Otis Elevator Co., Cleveland 2, Ohio.

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Hyster Co., Portland 8, Ore.

Mercury Mfg. Co., The, A Subsidiary of Pettibone Mulliken Corp., Chicago 51, Ill.

Motec Industries, Inc., Hopkins, Minn.

Towmotor Corp., Cleveland 12, Ohio.

Transitier Truck Co., Swan Island, Portland 17, Ore.

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

Trucks, Industrial, Type LPS (400 R5.13)

LOOK FOR THE LABEL

These are liquefied petroleum gas engine-powered trucks which are judged under requirements similar to those applying to Type LP trucks. Special features are provided as additional safeguards to further reduce the inherent fire hazards of the electrical, fuel, and exhaust systems.

Design of fuel system is based on the requirements of NBFU Pamphlet 58.

The Type LPS trucks listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label as illustrated:

Underwriters' Laboratories, Inc.®
INSPECTED
POWER-OPERATED
INDUSTRIAL TRUCK
TYPE LPS No._____

The label of Underwriters' Laboratories, Inc., attached to a product, is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Label Service

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Hyster Co., Portland 8, Ore.

Towmotor Corp., Cleveland 12, Ohio.

Transitier Truck Co., A Subsidiary of Pettibone Mulliken Corp., Swan Island, Portland 17, Ore.

Yale & Towne Mfg. Co., The, Philadelphia Div., Philadelphia 15, Pa.

TUBING (121 U0.21)

Reexamination Service

Bundy Tubing Co., Detroit 14, Mich.

Steel tubing, Types G&OB, G&OE, G&OTB, G&OTE, in 3/16-, ¼-, 5/16-, ⅜-, 7/16-, and ½-in. OD, where the acceptability of the combination is to be determined by Underwriters' Laboratories, Inc.

Marking: Listee's name and type designation.

Flexonics Corp., Rock Falls, Ill.

Flexible metal hose, Type RWA. Internal diameter ¼, 5/16, ⅜, ½, ¾, and 1 in. Lengths 12 to 42 in. between couplings.

Marking: Listee's name and Type "RWA" stamped on coupling.

LIST OF MARKINGS

The following is a list of markings used for identifying devices listed under Reexamination Service where the accepted marking does not include the listee's name.

Having determined the listee's name, reference should be made to the group under which the device is classified to determine if the product is listed.

No markings appearing on the devices listed under the Label Service are included here since the label is evidence of compliance with the requirements of Underwriters' Laboratories, Inc.

"A" with attached wing and letter "LPG" stamped on fitting—Aeroquip Corp.

"AP" in a clock wheel and "CC"—Controls Co. of America, A-P Sales Div.

"Algas"—American Liquid Gas Corp.

"Buss"—Bussmann Mfg. Div., McGraw-Edison Co.

"P" and LPG roll-stamped on fittings—Parker Fittings & Hose Div., A Div. of Parker Hannifin Corp.

"Rego"—Bastian-Blessing Co., The.

"S"—Stratoflex, Inc.

"S. W."—Stewart-Warner Corp.

"W" with arrow in a hexagon—Weatherhead Co., The.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality or merit.

Burglary Protection Equipment List

Numbers following classification headings are the card file guide numbers. All appearing in this section are on gray colored cards.

This List covers devices, materials, and systems which have been inspected and classified with respect to protection afforded against burglary, robbery, or theft as defined under Ratings.

RATINGS

Burglary—includes breaking or entering, safe-cracking, or any unlawful entry or attempt at entry to commit a felony or theft.

Robbery—includes attempts to obtain valuables by force or violence, such as armed robbery, bank hold-up, messenger or paymaster robbery, etc.

Theft—includes stealing of property or an article of value which is not taken by force and violence or by fraud.

INSTALLATION AND USE

Burglary, robbery, and theft protective systems in this List are examined for use in ordinary locations, unless otherwise specified.

Many protective systems require extensive installation work and maintenance by the Listed installing company. Included are bandit-resisting enclosures, all types of burglar alarm systems, gas and chemical systems, and hold-up alarm systems. The Standards of Underwriters' Laboratories, Inc., for such systems, cover installation methods, extent of protection, and maintenance service, which are supervised under the Reexamination and Certificate Service as described below.

INSPECTION SERVICES

Reexamination and Certificate Service

Under the Reexamination and Certificate Service, Underwriters' Laboratories, Inc. makes periodic examinations and tests of the listed equipment at factories, and, in addition, authorizes the issuance of the Laboratories' certificates to installations which the listed installing company represents to be in compliance with requirements established for the class. The certificate indicates the classification, extent, and location of equipment, period covered by the certificate, and name of the installing company.

Underwriters' Laboratories, Inc. conducts countercheck field inspections of representative installations of each listed installing company, but assumes no liability for any loss which may result from failure of the equipment, incorrect certification, or non-conformity with requirements. If installations not in compliance with the Laboratories' requirements are found as a result of field inspections, they are subject to correction by the listed installing company or cancellation of the certificate.

Appearance of a listee's name in this List does not mean that all of his products of the Listed classification comply with the Laboratories' requirements. Only those field installations which actually bear the certificate are supervised by Reexamination and Certificate Service.

The location of the manufacturer's or installing company's headquarters is given in each case, but many maintain branch offices, operating stations, or selling agencies in localities other than those recorded in this List.

Other Inspection Services

For description of Label Service, Reexamination Service, and Special Services, consult heading entitled "Follow-Up Program" in the Introductory section of this combined List.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality or merit.

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ALARM SYSTEM UNITS (25 L0)

CENTRAL STATION ALARM UNITS (25 L3E)

Burglary and Robbery—Reexamination Service

Denzler, F., Pomona, Calif.

"Model A, Duplex Tour System" consists of a central station panel unit and a multiplicity of subscriber units. System operates on 66-v, d-c supply, 6-v, d-c central station alarm light and buzzer supply, and 7½-v dry-cell premises circuit supply. Locating, identifying, and rechecking subscriber routines are accomplished through central station switching which tours the loop from either end.
Suitable for Grade A central stations with one or two subscribers and for Grade B central stations with three or four subscribers connected to a single central station line unit.
Marking: Metal name plate bearing the model designation, name and address of owner is attached to the central station and subscriber's unit.

Imperial Products Co., Inc., Long Island City 1, N. Y.

Model T53. Consists of electromechanical transmitters Cat. Nos. McPT1 or McPT2 with Grade A local mercantile alarm housing and a relay panel which provide for the automatic transmission and recording of signals between a subscriber's premises and a central station.
Suitable for Grade A central station.
Marking: Name and address of listee and model designation.

Mosler Research Products, Inc., Danbury, Conn.

Models Sentinel No. 1 and No. 2. Amplified sound detection systems for reverberant or non-reverberant bank or mercantile vaults.
Marking: A name plate attached to the device bears the model designation and the name.

Potter Electric Signal Co., St. Louis 3, Mo.

Model BAC. An individual line central station system consisting of Model DLP-4 or -5 switchboard panels, Cat. No. SCB-2 subscribers unit. Suitable for Grade A service.
Model CIRA or CIRB with or without suffixes E, L, N. An electromechanical transmitter and Model MRP relay panel.
Model PSA Soundalarm with suffixes C, FL, S. An amplified sound detection system for reverberant and nonreverberant bank or mercantile vaults.
Model GTR. Test unit for foreign grounds.
Model STR. Test unit for remotely testing an electronic device.
Model DTR. Test unit for remotely testing two electronic devices used in conjunction with Model STR.
Marking: A name plate attached to the device bears the model or catalog designation and the manufacturer's name or the letter "P" in a circle.

Reeve Electrical Co., Inc., The, New York 13, N. Y.

Model Dynalarm. Consisting of an electronic control cabinet, microphone and sound test units designed for central station service.
Suitable for use in bank or mercantile reverberant or non-reverberant vaults.
Model GCA-2. Consisting of an electromechanical transmitter and a relay panel which provides for automatic transmission and recording of signals between a subscriber's premises and a central station.
Suitable for use in Grade B central station installations where Grade A service is provided.
Marking: Listee's name and address and model designation.

Sentinel Alarm Corp., Philadelphia 7, Pa.

Model BCO-C2. An individual line central station system consisting of Models 5-CORP-W and CBA-30 switchboard panels and Models SI, SI-S, or -S2 subscriber units. Models ETU and ITU. External and internal test units for use with SI-S and -S2 subscriber units.
Marking: A name plate attached to the device bears the manufacturer's name and model designation or the catalog or model designation stamped on the device.

Smith Detective Agency & Nightwatch Service, Inc., Dallas, Texas.

Model GAS50. Consists of individual line type central station switchboard and Model GAS20 subscriber's unit which contains suitable supervising and signaling apparatus. The units are designed for use in conjunction with Grade A or Grade B central station burglar alarm installations.
Marking: Bakelite name plate attached to switchboard and subscriber's unit and model designation.

CONTACTS AND SWITCHES (25 L3O)

Burglary and Robbery—Reexamination Service

Ademco, Inc., Brooklyn 33, N. Y.

"Ademco." Insulated and noninsulated contact springs and mating brackets, Cat. Nos. 79, 80, 81, 82, 84, 232.
Flexible connectors, Cat. Nos. 70, 71.
Test clips, Cat. Nos. 181, 182.
Magnetically-actuated contacts, Cat. Nos. 34, 34-2, 35, 40, 40-2.

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Alarm System Units—Contacts and Switches—*Continued*

Mercury contacts, Cat. Nos. 162, 163, 164.
Tamper switch, Cat. No. 19.
Vibration detector, Cat. No. 10.
Floor mat. A supervised mat which initiates an alarm when stepped on, Cat. No. 123-130.
Marking: "ADEMCO" in an oval, "Alarm Device Mfg. Co., Brooklyn, N. Y." or "Alarm Co., Inc., Brooklyn 6, N. Y." stamped or molded on each unit.

Alarm Products, Inc., Union City, N. J.

Magnetically actuated contacts provided with and without shunt mechanism for use on tempered glass and other doors. Models MSR and MSS.
Designed for use in protective circuits of local burglar alarm systems.
Marking: APC stamped on switch cover.

Bay Alarm Co., Oakland 6, Calif.

Magnetically actuated contact Type TT-46.
Marking: Type designation and letters "DAC" stamped on enclosure.

Central Station Signals, Inc., New York 10, N. Y.

Vibration detector, Model Cerberus.
Heat, vibration and movement detector, Model SP for safes.
Marking: "Cerberus Swiss Made" molded in base or Model SP stamped on base.

Certified Alarm & Signal Co., Toledo 6, Ohio.

Magnetic safe contact, Model 22.
Marking: Listee's name and Model 22 stamped on base or cover.

Chicago Lock Co., Chicago 14, Ill.

Ace 4901-A key controlled contacting device for shunting protection on doors during egress or ingress. Designed for use in mercantile local burglar alarm and holdup alarm systems.
Marking: Trade name "Ace" and No. 4901-A stamped on the barrel of the lock.

Electro-Protective Corp., Newark 4, N. J.

Flexible connectors, Cat. Nos. 101, 102.
Magnetically actuated contacts, Cat. Nos. 61, 62.
Mercury contacts, Cat. Nos. 301, 302.
Marking: Cat. No. and "EPC" or "E" stamped on each unit.

Fruh & Co., A. W., Chicago 14, Ill.

"Ace." Insulated and noninsulated contact springs and mating brackets, Cat. Nos. 30, 31, 111-119 incl., 123-25 incl., 132, 137-40 incl., 172. Insulated plunger contact for safes and vaults, Cat. No. 168.
Magnetically actuated contacts, Cat. Nos. 161, 161H.D., 165, 165H.D.
Mercury contacts, Cat. Nos. 148, 148A, 148B.
Fire escape mercury contact, Cat. No. 149.
Flexible connector, Cat. No. 120.
Polarized cord connector, Cat. No. 121.
Vibration detector, Cat. No. 170-F.
Vibration detector supervising panel, Cat. No. 74.
Door shunting switch, Cat. No. 70.
Marking: "Ace"; also catalog designation on device.

Guardian Alarm Supply Co., Chicago 41, Ill.

Consists of insulated and noninsulated contact springs and brackets designed to carry circuits onto movable openings and to open or cross protective circuits, Cat. Nos. 2902, 2904, 2906, 2910.
Flexible connector, designed to carry circuits across hinged side of doors. Suitable for use on burglar and holdup alarm systems not exceeding 50 v, dc, and 250 w.
Marking: The letter "G" in a circle stamped on the device.

Imperial Products Co., Inc., Long Island City 1, N. Y.

"IPC" Insulated and noninsulated contact springs and assorted mating contact brackets designed to carry protective circuits Cat. Nos. FS and STS.
"IPC" Mercury contacts for pivoted type windows and hatches, Cat. No. Hg.
"IPC" Magnetically actuated contacts for heat treated glass and other doors, Cat. No. Mg.
Flexible connectors. For carrying circuits across the hinged side of doors. Cat. No. D. Suitable for use on burglar alarms and holdup systems not exceeding 50 v, dc, and 150 w.
Marking: "IPC" stamped in circle on each unit.

Potter Electric Signal Co., St. Louis 3, Mo.

Model V-1. Plunger-actuated contact, for vault doors.
Model BSC. Hood type contact for safe doors.
Insulated springs and mating contact brackets for movable openings. Cat. Nos. 106, 107, 108.
Model MDS. Magnetically actuated contact.
Marking: Listee's name and model or catalog designation or letter "P" in a circle.

Sentinel Alarm Corp., Philadelphia 7, Pa.

Model BDC, door contact. Model UC, utility contact.
Marking: Sentinel and model designation die-stamped on device.

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Alarm System Units—*Continued*

ELECTRONIC UNITS (25 L5)

Electronic units include those which utilize invisible rays (photo-electric), electromagnetic waves, ultrasonic radiation or other electronic principles to signal intrusion or movement within mercantile premises or approach to safes, stockrooms, etc. Electronic units are recognized in combination with or instead of conventional forms of wiring on walls, floors, ceilings and openings to the extent indicated in the Laboratories' List.

Individual listings indicate whether the units are suitable for connection to central stations only, local alarm systems or both, and will generally indicate the range, coverage, or limitations of the units.

The electronic units listed herein have been examined for fire and electrical shock hazards and for stability of operation. The effect of radiation on radio communication or radio navigation has not been investigated. The Federal Communications Commission should be consulted for regulations governing the use and operation of radiation devices.

Burglary—Reexamination Service

Ademco, Inc., Brooklyn 33, N. Y.

Photoelectric units consisting of a light source, mirrors, and receiver to permit installation of a low visibility beam. Maximum beam length 200 ft.

Model 1300C suitable for Central Station use, operates on 24 v, ac.

Model 1300L suitable for Local Alarm use, operates on 24 v, ac with a dc standby source. The standby consists of a 6 v storage battery or the equivalent.

Intended for use in mercantile premises in conjunction with other form of wiring to qualify for alarm classification No. 2.

Marking: Ademco in cast letters and model number on unit.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

A Type C2908 Telapproach. An antenna array which provides a means for detecting an intruder crossing its boundary. An electronic control detects small changes in an electrostatic field between the antenna wires and between the wires and ground.

Intended for use in outdoor perimeter protection systems with annunciator equipment and also in conjunction with central station systems.

Marking: Listee's monogram ADT and type number.

Electro-Security Corp., Webster, Mass.

Model 100C Radar-Eye. An electronic system operating in the ultra high frequency range, arranged so as to transmit an alarm when any movement of a person occurs within the protected area.

Intended for use in mercantile premises in conjunction with other forms of wiring for direct-wire central-station service.

Marking: Manufacturer's name and address, the model designation, and the electrical rating on the name plate.

Kidde Ultrasonic & Detection Alarms Div., Walter Kidde & Company, Inc., Clifton, N. J.

Models 956 and 957 Central Station Systems; Models 954 and 955 Local Alarm Systems; Models 950 and 951 Proprietary Systems. Ultrasonic systems arranged so as to transmit an alarm when any movement of a person occurs within the protected area.

Model PA-30. Power amplifier for ultrasonic systems.

Models 1100 and 1105. Photoelectric unit consisting of a light source, mirrors, and receiver to permit installation of a low visibility beam. Suitable for central station use, and local use if stand by source is provided. Max. beam length Model 1100, 700 ft; Model 1105, 250 ft.

Model BCA155. An electronic unit connected by means of an antenna system, arranged to transmit an alarm upon approach or contact with a protected safe. Suitable for central station or local use.

Marking: Name, address of listee and model designation.

Mosler Research Products, Inc., Danbury, Conn.

Models AL-25CL and AL-25CS. Systems composed of an electronic unit connected by means of an antenna system, arranged so as to transmit an alarm upon approach or contact with the protected safe.

Intended for use in mercantile or bank installation in conjunction with door contacts to qualify for complete safe alarm classification. Suitable for local or central station alarm connection.

Marking: Name and address of manufacturer and model designation.

FLOOR TRAPS (25 L6L)

Burglary—Reexamination Service

Ademco, Inc., Brooklyn 33, N. Y.

"Ademco." A floor trap of the closed-circuit conductor type for use on mercantile local burglar alarm systems to protect floor areas of mercantile premises. The trap operates to break the protective circuit.

Marking: "Ademco" stamped on trap units.

Fruh & Co., A. W., Chicago 14, Ill.

"See Cat. No. 108." A floor trap of the closed-circuit conductor type for use on mercantile local burglar alarm systems to protect floor areas of mercantile premises. The trap operates to break the protective circuit.

"See Cat. No. 106CS." A floor trap of the closed-circuit conductor type for use on mercantile local or central station burglar alarm systems. The trap operates to open and close the protective circuits.

[illegible] plug unit.

NTED CLOSE TO EDGE

Alarm System Units—Floor Traps—*Continued*

Guardian Alarm Supply Co., Chicago 41, Ill.

Cat. No. 2900. A floor trap of the closed-circuit conductor type for use on mercantile local burglar alarm systems to protect floor areas of mercantile premises. The trap operates to break the protective circuit.
Marking: The letter "G" in a circle stamped on unit.

HOLDUP ALARM UNITS (25 L8)

Robbery—Reexamination Service

A.R.F. Products, Inc., River Forest, Ill.

Model M16A. A remote control receiver designed to detect radio signals from a transmitter within range of the antenna.
Model MC5. A portable remote-control transmitter designed to send a selective signal to a receiver within 50 feet of the transmitter.
These units may be used with a manual holdup alarm system to supplement the required fixed stations. The receiver shall be in a protected cabinet with a suitable standby power supply.
Marking: Listee's name and model designation.

Fruh & Co., A. W., Chicago 14, Ill.

Model 150. A manual system. Consists of Cat. No. 150 control unit, Cat. Nos. 151, 153, 154 or 155 police station unit, and Cat. Nos. 195 and 196 manually operated initiating devices.
Marking: Metal name plate on control units bears manufacturer's name and address and catalog number. "Ace" and catalog number stamped on units.

Potter Electric Signal Co., St. Louis 3, Mo.

Model HUT. A coded manual system. Consists of Cat. No. HUT transmitter and Cat. No. HUB, HUR, HUS manually operated initiating devices.
Model HUT-B. A non-coded manual system. Consists of Cat. No. HUT-B transmitter and Cat. No. HUB, HUR, HUS manually operated initiating devices.
Marking: Metal name plate on devices bearing the manufacturer's name, address and catalog designation.

Sentinel Alarm Corp., Philadelphia 7, Pa.

Model HAU. A non-coded plug-in transmitter for use with Model SI-S burglar alarm control unit.
Model PB. Manually operated hand station.
Marking: Listee's name or Sentinel and model designation on each unit.

LININGS AND SCREENS (25 L121)

Burglary—Reexamination Service

Fruh & Co., A. W., Chicago 14, Ill.

Model Ace. Fixed and removable protective dowel screens for use in mercantile burglar alarm installations.
The screens consist of fine copper wires imbedded in selected wood dowels and supporting frame members and secured by special compound. Dowels are spaced not more than 4 in. on centers with adjacent dowels wired in separate circuits. Protective circuits are carried off from all four corners or terminate in movable contact members. The size of the screen varies with the size of the opening to be protected. All screens are finished with one or more coats of varnish.
Marking: "Ace" branded in frame of each screen.

Guardian Alarm Supply Co., Chicago 41, Ill.

Model G. Fixed and removable protective dowel screens for use in mercantile burglar alarm installations.
The screens consist of fine copper wires imbedded in selected wood dowels and supporting frame members and secured by special compound. Dowels are spaced not more than 4 in. on centers with adjacent dowels wired in separate circuits. Protective circuits are carried off from all four corners or terminate in movable contact members. The size of the screen varies with the size of the opening to be protected. All screens are finished with one or more coats of varnish.
Marking: Letter G in a circle branded in frame of each screen.

Ideal Alarm & Signal Co., Danville, Ill.

Model Ideal AA. Fixed protective dowel screens for use in mercantile burglar alarm installations. The screens consist of fine copper wires imbedded in selected wood dowels and supporting frame members and secured by special compound. Dowels are spaced not more than 4 in. on centers with adjacent dowels wired in separate circuits. Protective circuits are carried off from all four corners. The size of the screen varies with the size of the opening to be protected. All screens are finished with two or more coats of varnish.
Marking: Ideal "AA" branded or prominently marked on frame of each screen.

Potter Electric Signal Co., St. Louis 3, Mo.

Model P. Safe cabinet. A system of electrical conductors of foil and contacts applied to a cabinet constructed of wood for enclosing a safe for complete alarm protection.
Model P. Screens of either fixed or removable type consist of a wood frame with dowels and crossmembers which are grooved to embed a fine wire. Wire is cov[ered] with a hard-drying compound.
Marking: Letter "P" in a circle stamped into frame of screen and in [the] of the door on safe cabinet.

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Alarm System Units—*Continued*

LOCAL ALARM UNITS (25 L12O)

Burglary—Reexamination Service

Ademco, Inc., Brooklyn 33, N. Y.

Type A. Consists of a control unit Cat. No. A, AP, A-24, or A-24P and an alarm housing unit designed for use in Grade A local mercantile burglar alarm installations.
Model 121. Police station alarm unit for auxiliary connection to 1-5 local alarm installations.
Marking: Metal name plate on control unit with model number and name and address of manufacturer; also trade-mark "Ademco" in oval may be stamped on units.

Central Station Signals, Inc., New York 10, N. Y.

Model BA-PA remote station alarm unit for auxiliary connection to local alarm installations.
Marking: A decalcomania label on the cabinet door bears the manufacturer's name and address and Model BA-PA.

Diebold, Incorporated, Canton 2, Ohio.

Model 114-10. An electronic control unit and alarm housings to provide complete Grade A local mercantile safe protection.
Marking: A metal name plate on the control unit with model number, name and address of manufacturer.

Fuh & Co., A. W., Chicago 14, Ill.

Model A. Consists of a control unit, Cat. No. 101 or 101-P and alarm housing Cat. No. 102, designed for use in Grade A local mercantile burglar alarm installations.
Model B. Consists of a control unit, Cat. No. 105 and alarm housing Cat. No. 103, designed for use in Grade B local mercantile burglar alarm installations.
Model 101SV. Consists of a control unit, Cat. No. 101SV or 101SV-P and an alarm housing Cat. No. 102SV, designed for use in Grade A local mercantile safe and vault burglar alarm installations.
Models 151, 153, 154, and 155. Police station alarm units for auxiliary connection to one, three, six, or twelve local alarm installations. When the suffix W is used it indicates that the unit is a watchman's control panel with a lock-in relay feature.
Model 129. Battery box for use with combination systems.
Marking: Metal name plate on control unit with model number or "Ace Heavy Duty" or model number stamped inside cover, and name and address of manufacturer.

Guardian Alarm Supply Co., Chicago 41, Ill.

Model 5009. Consists of a control unit, Cat. No. 5002 and bell housing, Cat. No. 5001, designed for use in Grade A local mercantile burglar alarm installations.
Model 5005. Consists of control unit, Cat. No. 5006 and alarm housing, Cat. No. 5007, designed for use in Grade B local mercantile burglar alarm installations.
Model 5012. Police station control panel for auxiliary connection to six local alarm installations.
Marking: Metal name plate on control unit with model number and name and address of manufacturer.

Imperial Products Co., Inc., Long Island City 1, N. Y.

Model 48. Consists of a subscriber's control unit. Cat. Nos. LSCC1, LSCC2, LSCC3 or LSCC4 and alarm housing designed for use in Grade A local mercantile burglar alarm installations.
Model 156. A multi-circuit control unit providing from two to ten protective circuits. Designed for use in Grade A local mercantile burglar alarm installations.
Marking: Metal name plate on control unit with model number and listee's name and address.

Mosler Research Products, Inc., Danbury, Conn.

Model 400. Consists of an electronic control unit and an alarm housing designed to provide complete Grade A local mercantile safe protection.
Model 300. An accessory control to provide for connection of premises wiring to the Model 400.
Model PAC. Police station unit for use with model century local bank vault alarm.
Marking: Metal name plate on the control unit with model number, name and address of manufacturer.

New Way Burglar Alarm, Chicago 47, Ill.

Model 105A. Consists of subscriber's control unit and alarm housing unit designed for use in Grade A local mercantile burglar alarm installations.
Marking: "New Way Alarm" and Model No. 105A on metal name plate attached to each unit.

POWER SUPPLIES (25 L16)

Burglary—Reexamination Service

Fuh & Co., A. W., Chicago 14, Ill.

Cat. No. 240. For the protection circuit of local mercantile burglar alarm systems. Input 115 v, 7-10 va, 50-60 cy; output 6 or 12 v, 45-90 ma. Provided with standby battery.
Cat. No. 241. For police and remote station control units. Input 115 v, 60 cy, 55 va; output 6 v, ac, 5 amps, 6 v, dc. Provided with standby battery.
Marking: Manufacturer's name and address, electrical ratings, and catalog desig-

NTED CLOSE TO EDGE

Alarm System Units—Power Supplies—*Continued*

Potter Electric Signal Co., St. Louis 3, Mo.

Model DCR. For the protection circuit of local or transmitter type mercantile burglar alarm systems. Input 115 v, 5 va, 50-60 *cy*; output 6 v, dc, 10 ma and 6 v, ac, 20 ma.
Marking: Listee's name, electrical ratings, and model designation.

Supreme Development Corp., New York 16, N. Y.

Type S. For protection circuit of local mercantile burglar alarm systems. Input 117 v, 0.4 w, 60 *cy*; output 2.4, 3.6, 4.8, or 6.0 v, 4 or 8 ma.
Marking: Manufacturer's name and address, electrical ratings, and type designation.

World Electric Protection Co., Inc., Brooklyn 26, N. Y.

Types A and B. For the protection circuit of local mercantile burglar alarm system. Input 115 v, 60 cy; output 7½ and 4½ v, dc. Provided with standby battery.
Marking: Manufacturer's name and address, type designation, input and output ratings.

RELAYS (25 L18E)

Burglary and Robbery — Reexamination Service

Sigma Instruments, Inc., South Braintree, Boston 85, Mass.

Consisting of coil, armature, and contact assembly. Unenclosed; with aluminum dust cover on 5 pin plug-in base; with splash cover on 5 pin plug-in base; or hermetically sealed on a stud or octal plug-in base.
Designed for use in all types of burglar alarm systems and not exceeding a contact load of 2 amp for Type 4 and 3 amp for Type 5 at 28 v, dc.
Marking: Sigma Instruments and Type 4 or 5 with suffix letters on relay or cover.

SOUNDING DEVICES (25 L19O)

Burglary and Robbery — Reexamination Service

Ademco, Inc., Brooklyn 33, N. Y.

Type A. A 10-in. weatherproof, vibrating type gong for use in mercantile local burglar alarm and holdup alarm housings mounted out of doors. Rated for 6 v, dc.
Type U. An 8- or 10-in. underdome vibrating type gong for use in mercantile local burglar alarm and holdup alarm housings mounted out of doors. Rated for 6 v, dc.
Marking: "Ademco" cast on cover or base and metal name plate with listee's name, address, type designation, and dc rating.

Fruh & Co., A. W., Chicago 14, Ill.

"Ace" Cat. Nos. 132, 133, 134, and 200 underdome, semienclosed bell for use in local mercantile burglar alarm and holdup alarm housings mounted out-of-doors. Rated for 6-v, dry-battery supply. Eight-, 10-, and 12-in. diameter gongs furnished with either a cast- or pressed-aluminum shell.
Marking: A metal name plate bolted to bell frame bears listee's name, word "Ace," catalog designation, and voltage rating.

Imperial Products Co., Inc., Long Island City 1, N. Y.

Model SB1. Eight-inch weatherproof, vibrating type bell for use in local mercantile burglar alarm and holdup alarm housing mounted out-of-doors. Rated for 6 v, dry battery supply.
Marking: A paper name plate glued to bell bearing the manufacturer's name, model number, 6 v, dc and .3 amp rating.

Reeve Electrical Co., Inc., The, New York 13, N. Y.

Models O, P. Eight- and ten-inch semi-enclosed and weather-proof, vibrating type bell for use in local mercantile burglar alarm and hold-up alarm housing mounted out of doors. Rated for 6 v, dry battery supply.
Marking: Aluminum disc tightly cemented to gong with manufacturer's name, type number and 6 v, dc rating.

Spies Electric Works, Chicago 7, Ill.

Model "D" weatherproof, vibrating type, 7.5 and 9 v, 10- and 12-in. bell.
Model 50-8 and 50-10 underdome vibrating type, 6 v, 8- and 10-in. bell.
These bells are for use in mercantile local burglar-alarm and holdup-alarm housings mounted out-of-doors.
Marking: Metal name plate riveted to motor cover or to base bearing manufacturer's name and address, model number, and electrical characteristics of the bells.

BULLET-RESISTING ENCLOSURES (40 R0)

Bullet-resisting Enclosures are intended for protection against interior robbery of premises in which money, securities, or other valuables are handled.
A bullet-resisting enclosure consists of bullet-resisting devices and materials, such as glass, steel, deal trays, voice panels, gunports, and the like, installed between working quarters and space used by the public. The bullet-resisting construction is required to a height of at least 7 ft from the floor. Supplementary mechanical defense is required above this height and over exterior windows to protect against unauthorized access to the working quarters. In addition, doors which give access to the working quarters are required to have automatic locks and closers.

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Bullet-Resisting Enclosures—*Continued*

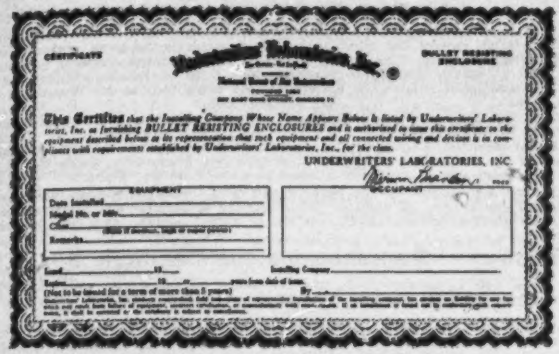
Enclosures are designed for protection against medium-power small arms, high-power small arms, or super-power small arms as defined under title "Bullet-resisting Materials," Guide No. 40 U6.

Listed companies maintain specially trained installers and have demonstrated their ability to install equipment in a workmanlike manner in accordance with the requirements of Underwriters' Laboratories, Inc.

Systems of this class are required to be maintained under the care and inspection service of the installing company.

Listed Bullet-resisting Enclosure installations may be identified by a certificate of the form illustrated.

It is required that listed bullet-resisting materials and devices subject to periodic factory inspection be employed. Inspections in the field are made to verify the use of proper materials, correctness of installation, completeness of protection, and workmanship.


CERTIFICATE

Underwriters' Laboratories, Inc.

BULLET RESISTING ENCLOSURE

This Certifies that the Installing Company Whose Name Appears Below Is Listed by Underwriters' Laboratories, Inc. as Furnishing BULLET RESISTING ENCLOSURES and Is Authorized to Issue This Certificate for the Equipment Described Below as Its Representation That Such Equipment and All Connected Wiring and Devices Is in Compliance with Requirements Established by Underwriters' Laboratories, Inc., for the Class.

UNDERWRITERS' LABORATORIES, INC.

EQUIPMENT

OCCUPANCY

Installing Company

By

Certificate for Bullet-Resisting Enclosures

The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field counter check program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements.

Robbery—Reexamination and Certificate Service

Chicago Bank Equipment Co., Inc., Chicago 40, Ill.

Bullet-resisting enclosure comprising partitions equipped with listed bullet-resisting glass and other bullet-resisting devices comprising the following units:

Medium-power small arms. Gunports, MP2 and MP22; deal trays, MP1 and MP11; voice panel, MP4; package passers, MP3 and MP6.

High-power small arms. Gunport, HP2; deal tray, HP1; voice panel, HP4; package passers, HP3 and HP6.

Marking: The manufacturer's name together with the type designation and letters are stamped on each device.

Chicago Bullet Proof Equipment Co., Chicago 8, Ill.

Bullet-resisting enclosure comprising partitions equipped with listed bullet-resisting glass and other bullet-resisting devices comprising the following, constructed of steel, bronze, and glass:

Medium-power small arms, Gunports, MP2 and MP22; deal trays, MP1 and MP11; voice panel, MP4; package passers, MP3 and MP6.

High-power small arms, Gunport, HP2; deal tray, HP1, voice panels, HP4 and HP7; package passers, HP3 and HP6.

Marking: The manufacturer's name plate together with the type designation and letters are die-stamped on each device.

Diebold, Incorporated, Canton 2, Ohio.

Bullet-resisting enclosure comprising listed bullet-resisting glass and other bullet-resisting devices comprising the following units:

Medium-power small arms. Gunports, PB-10050, SC-6318; pass trays, 01-30014, PA-5556, PB-10053; package passers, 01-30054, -30380, PB-10046, -10049, -10052; wickets, 01-30655-Rotary, -30074-Pass tray, PA-5555, PB-10045; voice panel, PB-10048; 10-gauge steel plate.

High-power small arms. Gunport, SC-6318; pass trays, 01-30014, -300-77, PA-5556, PB-10047; wickets, 01-30653-Rotary, -30654-Pass tray, PB-10055-Rotary, -10058-Pass tray, -10059-Rotary, -10060-Pass tray; 3/16-in. steel plate.

Super-power small arms. Gunports, 01-53997, 08-29560; pass trays, 01-30069, -54002; package depository, 01-30380; package receivers, 01-30054, 114-58; voice panel, 08-29822; 1/16 in. steel plate.

Marking: Each device is stamped with the name "Diebold" code designation as indicated above.

TED CLOSE TO EDGE

Bullet-Resisting Enclosures—*Continued*

Mosler Safe Co., Hamilton, Ohio.

Bullet-resisting enclosure comprising partitions equipped with listed bullet-resisting glass and other bullet-resisting devices comprising the following units:

Medium-power small arms. Bronze gunport, GP; bronze combination gunport and speaking apertures, GPS and VPGP; bronze and steel voice panel, VP-4; bronze and steel deal tray, DT; package receivers, PR and BBPR.

High-power small arms. Type TW steel voice panel; bronze and steel deal tray, BDT; bronze and steel combination package passer and deal tray, PDT; steel package receiver, BBHPPR and HPPR; combination gunport and speaker, HPVP; steel gunport, HPGP.

Marking: Each device is stamped with the name "DECO" and type designation.

BULLET-RESISTING ENCLOSURES AND ALARM SYSTEMS (40 S0)

This classification covers the combination of a specially designed alarm system with a bullet-resisting enclosure. The alarm system, usually battery operated, provides semi-automatic and automatic devices to transmit an alarm to outside vigilante stations if employees are ambushed outside the bullet-resisting protection as for example at opening or closing times.

Systems of this class are required to be maintained under the care and inspection service of the installing company.

Listed Bullet-resisting Enclosure and Alarm System installations may be identified by a certificate of the form illustrated for Bullet-resisting Enclosures, Guide No. 40 B0 with the words Enclosure and Alarm System typed or printed under "Remarks."

These systems are subject to the factory and field inspection service as described for bullet-resisting enclosures. In addition the electrical assemblies are inspected for quality of wiring, installation, workmanship, location of signal devices, and maintenance service furnished.

Robbery — Reexamination and Certificate Service

Diebold, Incorporated, Canton 2, Ohio.

"McClintock Bandit Barrier" electrical signaling and supervisory system comprising manual and automatic alarm initiating devices and apparatus to control and supervise the entrance to the bandit-resisting enclosure and vaults; connected to two or more vigilante stations

Marking: Metal name plate on control cabinet bearing the listee's name and model designation.

Mosler Safe Co., Hamilton, Ohio.

Model "Duplex" combination open and closed circuit electrical signaling system comprising manual and automatic alarm initiating devices and apparatus to supervise all entrances to the bandit-resisting enclosure; connected to two or more vigilante stations.

Marking: Metal name plate on control cabinet with manufacturer's name and model "Duplex."

BULLET-RESISTING MATERIALS (40 U0)

Unless otherwise specified all materials classed as bullet-resisting are tested for resistance to a shot gun and to scattered shots from **medium-power small arms.** Such materials are considered as affording reasonable protection when assembled into bandit-resisting enclosures. Consult heading title Bullet-resisting Enclosures for companies furnishing complete installations.

Materials described as suitable for medium-power small arms are tested for resistance to revolvers and pistols of stock pattern in common use. Included are small arms developing 1397 ft per sec velocity and 490 ft-lb energy at the muzzle.

Materials described as suitable for **high-power small arms** are tested for resistance to scattered shots from revolvers or pistols of unusual power. Included are custom built arms such as the .357 Magnum developing 1512 ft per sec velocity and 804 ft-lb energy at the muzzle.

Materials described as suitable for **super-power small arms** are tested for resistance to scattered shots from revolvers or pistols of superlative power. Included are custom-built arms such as the .44 Magnum developing 1570 ft per sec velocity and 1310 ft-lb energy at the muzzle.

Materials described as suitable for **high-power rifles** are tested for resistance to scattered shots from rifles developing 2800 ft per sec velocity and 2400 ft-lb energy or to short bursts from subcaliber machine guns.

GLASS (40 U7)

Bullet-Resisting Glass is used indoors in a complete Bandit-Resisting Enclosure and out-of-doors in armored cars or in a bullet-resisting tellers fixture assembled in an outside building wall for drive-in or walk-up banking. Therefore, unless otherwise specified, bullet-resisting glass is considered suitable for indoor and outdoor service. Such material is tested for performance when exposed to temperatures ranging from minus 25 F to plus 120 F.

Robbery — Reexamination Service

Amerada Glass Corp., Chicago 16, Ill.

Bullet-resisting glass is a laminated assembly consisting of plate glass bonded together by sheets of clear Saflex plastic.

Medium-power small arms. "Type BR-136" glass not less than 1¼ in. thick and "Type BR-118 glass not less than 1⅛ in. thick.

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Bullet-Resisting Materials—Glass—*Continued*

High-power small arms. "Type BR-112" glass not less than 1½ in. thick.
Super-power small arms. "Type BR-134" glass not less than 1¾ in. thick.
High-powered rifle. "Type BR-200" glass not less than 2 in. thick.
Marking: Name "Amerada" and type designation, sandblasted in glass near one corner.

American Saint-Gobain Corp., Pittsburgh 22, Pa.

Bullet-resisting glass is a laminated assembly consisting of layers of glass bonded together by sheets of clear polyvinyl butyral plastic.
Medium-power small arms Type "ASG-MP" bullet-resisting glass not less than 1-5/32 in. thick.
Marking: Three small triangles, underneath which will appear the type letters and the name "Armorlite."

Libbey-Owens-Ford Glass Co., Toledo 3, Ohio.

Bullet-resisting glass is a laminated assembly consisting of layers of plate glass bonded together by sheets of clear polyvinyl butyral plastic.
Medium-power small arms "Type MP" bullet-resisting glass not less than 1½ in. thick.
High-power small arms "Type HP" bullet-resisting glass not less than 1½ in. thick.
Super-power small arms "Type SP" bullet-resisting glass not less than 1¾ in. thick.
High-powered rifles "Type RR" bullet-resisting glass not less than 2 in. thick.
Marking: "LOF" in a shield, and "Bullet-Resisting Plate," together with type designation sandblasted in glass near one corner.

Multiplate Glass Corp., Glendale 27, L. I., N. Y.

Medium-power small arms. "Type X" bullet-resisting glass consists of four layers of glass and three layers of polyvinyl butyral plastic bonded together to form a laminated assembly not less than 1¼ in. thick.
High-power small arms. "Type XX" bullet-resisting glass consists of five layers of glass and four layers of polyvinyl butyral bonded together to form a laminated assembly not less than 1½ in. thick.
High-powered rifles. "Type XXX" bullet-resisting glass consists of five layers of glass and four layers of polyvinyl butyral bonded together to form a laminated assembly not less than 2 in. thick.
Marking: "MGC high test" in an oval and "Bullet Resistant" together with type designation sandblasted in glass near one corner.

Pittsburgh Plate Glass Co., Pittsburgh 22, Pa.

Bullet resisting glass is a laminated assembly consisting of layers of plate glass bonded together by sheets of clear polyvinyl butyral plastic.
Medium-power small arms. Type "Super" bullet-resisting glass not less than 1⅛ in. thick.
High-power small arms. Type "Hi-Resist" bullet-resisting glass not less than 1½ in. thick.
Super-power small arms. Type "Superpower" bullet-resisting glass not less than 1⅞ in. thick.
High-power rifles. Type "Hi Power" bullet-resisting glass not less than 2 in. thick.
Marking: "Multiplate," and type designation sandblasted in the corner of each section of glass.

Safetee Glass Co., Philadelphia 44, Pa.

Bullet-resisting glass is a laminated assembly consisting of three to six layers of plate glass or glass and plexiglas bonded together by sheets of clear polyvinyl butyral plastic.
Medium-power small arms. "Type XXXA" bullet-resisting glass not less than 1⅛ in. thick.
High-power small arms. "Type XXXB" bullet-resisting glass not less than 1½ in. thick.
Super-power small arms. "Type XXC" bullet-resisting glass not less than 1⅞ in. thick. "Type XXXC" light weight bullet-resisting glass not less than 1¾ in. thick.
High-powered rifles. "Type XXXXB" bullet-resisting glass not less than 2 in. thick.
Marking: "Safetee Bullet Resisting" and type designation stamped in one corner of each section of glass (outer face).

TELLERS' FIXTURES (40 U20)

Bullet-resisting tellers' fixtures are designed for installation in the outside wall of bank building to provide a sidewalk or drive-in banking facility.

The tellers' fixture is a complete assembly of bullet-resisting glass and steel, safety deal trays and usually 110 v, ac electrically operated package drawers, intercommunication system light fixtures and electrical outlets for use by the bank teller.

The bullet-resisting tellers' fixture is designed to protect against robbery from the exterior of the building. If accessible directly from working quarters within the bank, these working quarters should be separated from the public lobby by a bullet-resisting (bandit-resisting) enclosure bearing a certificate of Underwriters' Laboratories, Inc.

Robbery—Reexamination Service

Diebold Incorporated, Canton 2, Ohio.

Medium-power small arms. Models 114-28, -42, -44, -45, -47, -93. Electrical rating, 115 v, ac, 50-60 cy, 13 amp or less.
Marking: A metal name plate bears the manufacturer's name and address, electrical rating, Model 114 with proper suffix.

NTED CLOSE TO EDGE

Bullet-Resisting Materials—Tellers' Fixtures—Continued

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Medium-power small arms. Style Nos. 42-AF, -AFF, -CF, -CFF, 60-AB, -AF, -CF, -CF, 75-AB, -CB, 90-AB, -CB, 120-AFF, -CFF, 450-AB, -AF, -AFF, -CB, -CF, -CFF, 670-AB, -AF, -AFF, -CB, -CF, -CFF, 671-AB, -CB, 900-AB, -CB.

Marking: A metal name plate bears the manufacturer's name and address and "Bank Tellers' Window." Also the style designation and electrical rating.

Mosler Safe Co., Hamilton, Ohio.

Medium-power small arms. Model 1800A. Electrical rating, 115 v, ac, 50-60 c, 15 amp.

Marking: A metal name plate bears the listee's name, model designation and electrical rating.

BURGLAR ALARM SYSTEMS (42 U0)

Burglary—Reexamination and Certificate Service

Burglar alarm systems are classified as to type or principle of operation as Central Station or Local. They are further grouped according to the class of property for which available, that is, whether bank safe and vault, mercantile premises, or mercantile safe and vault. Each type of system is also divided into two or more grades. The functions of these general types of systems and the significance of the grades are described more fully under their respective headings.

All burglar alarm systems of listed pattern are investigated to determine the suitability of design and construction, circuit arrangement, installation methods, and maintenance service, as these several items have a bearing upon reliability of operation and protection against malicious tampering.

Regardless of their class, type, or grade, burglar alarm systems installed on individual properties may or may not be complete as to the extent or scope of protection applied. Certain well established definitions covering extent of protection for each class of property are given under the main headings, entitled "Bank Safe and Vault", "Mercantile Premises", and "Mercantile Safe and Vault".

Property owners should consult underwriting authorities or others having jurisdiction regarding the type of system, grade, and extent of protection recommended for a given hazard or locality.

Systems of this class are required to be maintained under the care and inspection service of the installing company.

Listed companies maintain specially trained installers and have demonstrated their ability to install equipment in a workmanlike manner in accordance with the requirements of Underwriters' Laboratories, Inc.

Listed system installations may be identified as to type, grade, and extent of protection by a certificate of one of the forms shown. Supervision by Underwriters' Laboratories, Inc. extends only to those installations which have an unexpired certificate.

Apparatus which is suitable and currently available for new construction is indicated in this list by a model or catalog number under each manufacturer's name. The omission of model numbers signifies that one or more models are in actual service under regular inspection and maintenance service on the listed company and are eligible for the continuation of the Laboratories' certificate of classification.

CENTRAL STATION (42 U3)

The terms "central station" and "central office" are used interchangeably.

A central station system is one in which the operations of electrical protection circuits and devices are signaled automatically to, recorded in, maintained, and supervised from a central station having trained operators and guards in attendance at all times. Guards are dispatched to make immediate investigation of unauthorized entry or opening of protected properties from which signals are received. Central station systems are independently owned, controlled, and operated by a person, firm, or corporation engaged in furnishing such supervised protective signaling service and having no interest in the protected properties.

Unless otherwise specified on the certificate of classification issued to each protective installation, the central station holds all keys necessary to permit immediate entrance and search of the interior of mercantile property by guards responding to alarms and troubles.

Central station systems are classified as Grade A or Grade B. Individual installations which comply with a lower grade than that in which a central office is specifically classified may be certificated in the proper lower grade.

The essential difference between Grade A and Grade B central station systems is in the character of protection service. A Grade A central station requires a force adequate to respond with two guards on all alarms in an average elapsed time of not more than 10 min. A Grade B central station requires a force adequate to respond to all alarms with at least one guard in an average elapsed time of not more than 15 min.

The majority of central station systems are the individual line type, wherein each protective equipment is connected over an exclusive circuit to individual sets of instruments at the central station.

Some systems employ a code transmitter in each premise, connected to and arranged to transmit signals to the central station over a loop circuit common to more than one property. These party line systems are not considered the equivalent of individual line systems and, accordingly, are classified as Grade B and then only when supported by Grade A guard service.

Listed Central Station System installations may be identified by a certificate of [illegible] illustrated.

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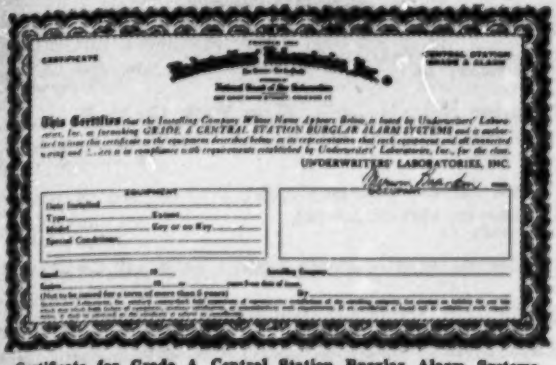
Burglar Alarm Systems—Central Station—*Continued*



Certificate for Grade A Central Station Burglar Alarm Systems

The certificate for Grade B Central Station Burglar Alarm Systems is the same as Grade A except for the grade letter.

The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field counter check program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements.

Inspections and tests conducted by the Laboratories' inspectors at factories cover the design, construction, and wiring of all essential units employed in the system. Particular attention is given to electrical insulation, spacings, contacts, wiring, and other items bearing upon the reliability of operation and protection against tampering.

Inspections and tests of representative installations in the field are made to determine the correctness of installation of protective devices and wiring, quality of workmanship, operability of circuits, maintenance, and extent of protection applied.

Periodic inspections and tests at central stations are conducted by the Laboratories' inspectors to verify the condition, adjustment, and operability of electrical equipment, the handling of subscribers' keys, and the adequacy of station personnel and records. Records at each central station are reviewed for representative periods on certificated equipments with respect to items such as average elapsed time in responding to alarms, number of guards dispatched, supervision of subscribers' daily openings and closings, reopenings, and any other irregularities occurring on protected properties.

The correctness of central station records covering protection service is further verified by "surprise night tests," created on protective circuits at times unknown to the station operators. The elapsed time, number of guards sent, and character of response to these surprise tests are observed and subsequently compared against records at the central station.

Bank Safe and Vault Alarm (42 U3.2)

The extent of protection as applied to central station alarm installations on bank safes and vaults is defined as follows:

Complete System.—Protecting with acceptable devices the top, bottom, all sides, and outer doors of safes or vaults.

Partial System.—Protecting with acceptable devices the outer door or doors only and only against opening.

American Alarm Co., Inc., Indianapolis 4, Ind.

Grade A. Models BCA-155 and PSA.
Service in Indianapolis.

American Fire Dispatch, Inc., Los Angeles 3, Calif.

Grade A. Models DLS-1, Sentinel No. 1 and No. 2, AL25CS, BCA-155.
Service in Los Angeles, Calif.

Call's Central Station Alarms, Chelsea, Boston 50, Mass.

Grade A. Model PSA Soundalarm.
Service in Boston, Mass.

Central Alarm, Phoenix, Ariz.

Grade A. Models 325, VA-300.
Service in Phoenix and Tucson, Ariz.

Central Alarm Co., Ltd., Honolulu 14, Hawaii.

Grade A. Models 200, PSA, AL-25CS.
Service in Honolulu, Hawaii.

NTED CLOSE TO EDGE

Burglar Alarm Systems—Central Station—Bank Safe and Vault Alarm—*Continued*

Central Station Alarms, Inc., Shreveport, La.

Grade A, Model SCB-2L, PSA, AL-25CS.
Service in Shreveport, La.

Central Station Signals, Inc., New York 10, N. Y.

Grade A. Model Dynalarm.
Service in New York, N. Y.

Central Watch Service, Chicago 10, Ill.

Grade A. Models 2S, AL25-CS, and PSA.
Service in Chicago, Ill.

Controlled Companies of American District Telegraph Co., New York 11, N. Y.

Grade A, Type 179-M. Phonetalarm Types 1020, 1024, Telapproach Type 2300.
Grade B with Grade A service, Types 250-BX, -D, 7108, Telapproach Type 2300, no Phonetalarm Type 7107.
Grade A service from central stations located in the following cities:

Akron, Ohio	Houston, Texas	Quincy, Ill.
Albany, N. Y.	Huntington Park, Calif.	Reading, Pa.
Allentown, Pa.	Indianapolis, Ind.	Richmond, Va.
Atlanta, Ga.	Jackson, Mich.	Rochester, N. Y.
Baltimore, Md.	Jacksonville, Fla.	Rockford, Ill.
Birmingham, Ala.	Jersey City, N. J.	Rock Island, Ill.
Boston, Mass.	Kalamazoo, Mich.	Sacramento, Calif.
Bridgeport, Conn.	Kansas City, Mo.	Saginaw, Mich.
Brockton, Mass.	Knoxville, Tenn.	St. Joseph, Mo.
Buffalo, N. Y.	Lansing, Mich.	St. Louis, Mo.
Camden, N. J.	Lincoln, Neb.	St. Paul, Minn.
Canton, Ohio	Long Island City, N. Y.	Salem, Mass.
Cedar Rapids, Iowa	Los Angeles, Calif.	Salt Lake City, Utah
Charleston, S. C.	Louisville, Ky.	San Antonio, Texas
Chattanooga, Tenn.	Madison, Wis.	San Diego, Calif.
Chicago, Ill.	Memphis, Tenn.	San Francisco, Calif.
Cincinnati, Ohio	Miami, Fla.	San Jose, Calif.
Cleveland, Ohio	Milwaukee, Wis.	Savannah, Ga.
Columbus, Ohio	Mineola, N. Y.	Scranton, Pa.
Dallas, Texas	Minneapolis, Minn.	Seattle, Wash.
Dayton, Ohio	Muncie, Ind.	Sioux City, Iowa
Denver, Colo.	Muskegon, Mich.	South Bend, Ind.
Des Moines, Iowa	Nashville, Tenn.	Spokane, Wash.
Detroit, Mich.	Newark, N. J.	Springfield, Mass.
Duluth, Minn.	New Brunswick, N. J.	Springfield, Ohio
East St. Louis, Ill.	New Haven, Conn.	Syracuse, N. Y.
El Paso, Texas	New Orleans, La.	Tacoma, Wash.
Erie, Pa.	New York, N. Y.	Terre Haute, Ind.
Evansville, Ind.	Oakland, Calif.	Toledo, Ohio
Flint, Mich.	Oklahoma City, Okla.	Trenton, N. J.
Fort Wayne, Ind.	Omaha, Neb.	Washington, D. C.
Fort Worth, Texas	Oshkosh, Wis.	Waterbury, Conn.
Galveston, Texas	Paterson, N. J.	Wichita, Kan.
Grand Rapids, Mich.	Peoria, Ill.	Wilmington, Del.
Hamilton, Ohio	Portland, Me.	Winston-Salem, N. C.
Hartford, Conn.	Portland, Ore.	Worcester, Mass.
		Youngstown, Ohio

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.

Grade A—Models AL25CS and PSA Soundalarm.
Service in Dayton, Ohio.

Federal Engineering Co., Inc., Washington 1, D. C.

Grade A. Model "Dynalarm."
Service in Washington, D. C.

Holmes Electric Protective Co., New York 1, N. Y.

Grade A. Models BV200, BV300, BV400, S400, and CS1400.
Grade A service in New York, N. Y., Philadelphia, Pa., and Pittsburgh, Pa.

McCane-Sondock Detective Agency & Burglar Alarm Co., Houston 2, Texas.

Grade A. Model PSA Soundalarm.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.

Grade A. Model VPD.
Service in Milwaukee, Wis.

Morse Signal Devices, Cleveland 3, Ohio.

Grade A. Models S248, V248, B6655.
Grade B with Grade A service. Models S148, V148.

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Burglar Alarm Systems—Central Station—Bank Safe and Vault Alarm—*Continued*

Newark District Telegraph Co., Newark 2, N. J.

Grade A. Models 65BV, 65-S, and Dynalarm.
Service in Newark, N. J.

Owl Protective Co., Inc., Philadelphia 7, Pa.

Grade A. Model Dynalarm.
Service in Philadelphia, Pa.

Potter Electric Signal Co., St. Louis 3, Mo.

Grade A. Models A-1, A-2.
Service in St. Louis, Mo.

Protection Engineering Corp., Los Angeles 44, Calif.

Grade A. Models P-10, P-12, P-14.
Service in Los Angeles, Calif.

Rhode Island Electric Protective Co., Providence 1, R. I.

Grade A. Models X 201 Phonetalarm, R.I.B., R.I.S.
Service in Providence, R. I.

Robinson Electronic Supervisory Co., Philadelphia 2, Pa.

Grade A. Models PSA Soundalarm, Sentinel.
Service in Philadelphia, Pa.

Sentinel Alarm Corp., Philadelphia 7, Pa.

Grade A. Model PSA Soundalarm.
Service in Philadelphia, Pa.

Smith Detective Agency & Nightwatch Service, Inc., Dallas, Texas.

Grade A. Models GAS32, GAS33, AL25CS.
Service in Dallas, Texas.
Marking: Listee's name and model designation on the control unit.

Mercantile Premises Alarm (42 U3.13)

Systems listed in the Mercantile Premises classification are considered suitable for protection of mercantile premises and stock rooms but not for protection of safes and vaults.

Systems listed in the classification Mercantile Safe and Vault Alarm may also have premises wiring connected to the same alarm with a separate certificate issued to each class.

The extent of central station alarm protection installed on mercantile premises is classified as Installation 1, 2, or 3 in accordance with the following definitions:

Installation 1—Completely protecting all windows, doors, transoms, skylights, and other openings leading from the premises, and all ceilings, floors, and hall, party, partition, and building walls enclosing the premises, except building walls which are exposed to street or public highway, and except that part of any building wall which is at least two stories above roof of an adjoining building.

Installation 2—Protecting with traps all inaccessible windows, and with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, and protecting all ceilings and floors not constructed of concrete, and all hall, partition, and party walls enclosing the premises, or

Protecting with supervisory contacts only all movable openings leading from the premises, and providing a system of invisible radiation to all sections of the enclosed area, so as to detect four-step movement, or

Protecting with traps all inaccessible windows; with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises; and providing a network of invisible beams to subdivide the floor space of each floor or separate section of the protected area into three approximately equal areas, and more where necessary to provide at least one subdivision per 1000 sq ft of floor space.

Installation 3—Protecting with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, or

Protecting with contacts only all movable accessible openings leading from the premises and providing one or more invisible rays or channels of radiation with the minimum over-all length of the rays or radiation equivalent to the longest dimensions of the area or areas so as to detect movement through the channel at any point, or

Protecting with contacts all doors leading from the protected area or areas and providing a system of invisible radiation to all sections of the enclosed area so as to detect four-step movement.

Albany Protective Service, Albany 2, N. Y.

Grade A. Models DCP; 1100 photoelectric system.
[illegible] with Grade A service. Model A.
[illegible], N. Y.

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Burglar Alarm Systems—Central Station—Mercantile Premises Alarm—*Continued*

American Alarm Co., Inc., Indianapolis 4, Ind.

Grade A. Models SCB-2, 951, 1105.
Service in Indianapolis.

American Burglar Alarm Co., San Francisco 5, Calif.

Grade A. Model 1024A.
Service in San Francisco, Calif.

American Fire Dispatch, Inc., Los Angeles 3, Calif.

Grade A. Models DLS-1, 956-957, 1100, 1105, 1300-C.
Grade B. With Grade A Service, Model CTS-1.
Service in Los Angeles, Calif.

Automatic Alarm Corp., Minneapolis 5, Minn.

Grade A. Model SCB-2.
Service in Minneapolis, Minn.

Call's Central Station Alarms, Chelsea, Boston 50, Mass.

Grade A. Models SCB-2, 1300-C.
Grade B with Grade A service. Model CIRB.
Service in Boston, Mass.

Central Alarm, Phoenix, Ariz.

Grade A. Models CAM-1, SA-213.
Service in Phoenix and Tucson, Ariz.

Central Alarm Co., Ltd., Honolulu 14, Hawaii.

Grade A. Models 100, 956, 957.
Grade B with Grade A Service, Model 250.
Service in Honolulu, Hawaii.

Central Office Alarm Co., Inc., Long Island City 1, N. Y.

Grade A. Model Owl.
Grade B with Grade A Service. Model T-53.
Service in New York, N. Y.

Central Station Alarms, Inc., Shreveport, La.

Grade A, Models SCB-2, 956, 100C, 1300-C, 1105.
Grade B with Grade A Service, Model CA-3.
Service in Shreveport, La.

Central Station Signals, Inc., New York 10, N. Y.

Grade A. Models DCP, Sonic Guard, 1100.
Grade B with Grade A service. Model MCLT.
Service in New York, N. Y.

Central Watch Service, Chicago 10, Ill.

Grade A. Models 1, AC-4, 100-C, 110.
Grade B with Grade A service. Model CIRB.
Service in Chicago, Ill.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A. Type 179-M. Types B1700, 2201, 2207, 7103, 7104.
Grade B. Types 250-BX, 7108.
Service in cities listed under Bank Safe and Vault Central Station Burglar Alarm Systems.

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.

Grade A—Model SCB-2.
Service in Dayton, Ohio.

Denver Burglar Alarm Co., Inc., Denver 5, Colo.

Grade A. Models DBA1 and DBA2.
Grade B with Grade A service. Model MCA.
Service in Denver, Colorado.

Electro-Protective Corp., Newark 4, N. J.

Grade A. Model SCB-2.
Grade B with Grade A service. Model CIRB.
Service in Newark, N. J. and Baltimore, Md.

Federal Engineering Co., Inc., Washington 1, D. C.

Grade A. Model FE-1.
Grade B with Grade A service. Model CIRB.
Service in Washington, D. C.

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Burglar Alarm Systems—Central Station—Mercantile Premises Alarm—*Continued*

Granite State Alarm, Inc., Manchester, N. H.

Grade A. Model BAC.
Service in Manchester, N. H.

Holmes Electric Protective Co., New York 1, N. Y.

Grade A. Models M-100, 800, UM1200.
Service in New York, N. Y., Philadelphia, Pa., and Pittsburgh, Pa.

Kodzie Kane Alarm Co., Chicago 12, Ill.

Grade A. Models SCB-2, 1100, 1105, 1200C.
Service in Chicago, Ill.

McCane-Sondock Detective Agency & Burglar Alarm Co., Houston 2, Texas.

Grade A. Model A.
Grade B with Grade A service. Model B.
Service in Houston, Texas.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.

Grade A. Models 201, Ultrasonic, 100-C Radar-Eye.
Grade B with Grade A service. Model CIRB Transmitter.
Service in Milwaukee, Wis.

Metropolitan Electric Protection, New York 1, N. Y.

Grade A. Model 10.
Service in New York City.

Michigan Still Alarm Co., Div. of Michigan Burglar Alarm Systems, Detroit 4, Mich.

Grade A. Model MSA-1.
Grade B with Grade A service. Model MSA-2A.
Service in Detroit, Michigan.

Morse Signal Devices, Cleveland 3, Ohio.

Grade A. Models AC-4, B-248, 7556.
Grade B with Grade A service. Models B148, B158, B160.
Service in Cleveland, Ohio and Los Angeles, Calif.

Newark District Telegraph Co., Newark 2, N. J.

Grade A. Models AC4, 65, 1000.
Service in Newark, N. J.

Owl Protective Co., Inc., Philadelphia 7, Pa.

Grade A. Model Owl.
Service in Philadelphia, Pa.

Potter Electric Signal Co., Cincinnati 2, Ohio.

Grade A. Model SCB-2.
Grade B With Grade A Service. Model CIRB.
Service in Cincinnati, Ohio.

Potter Electric Signal Co., St. Louis 3, Mo.

Grade A. Models AC-4, SCB-2.
Grade B with Grade A service. Model CIRB.
Service in St. Louis, Mo.

Protection Engineering Corp., Los Angeles 44, Calif.

Grade A. Models PS-20, PD-40, PEC A-1300-C.
Grade B with Grade A Service, Model PC-110.
Service in Los Angeles, Calif.

Reliance Protective, Inc., Tulsa, Okla.

Grade A—Models SCB-2, 1300C.
Service in Tulsa, Okla.

Rhode Island Electric Protective Co., Providence 1, R. I.

Grade A. Models XR71, R.I., US100.
Service in Providence, R. I.

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Burglar Alarm Systems—Central Station—Mercantile Premises Alarm—*Continued*

Robinson Electronic Supervisory Co., Philadelphia 2, Pa.

Grade A. Model SCB-2 direct wire.
Model 956-957 ultrasonic system.
Model 1100 photoelectric system.
Grade B with Grade A Service. Model CIRB.
Service in Philadelphia, Pa.

Sentinel Alarm Corp., Philadelphia 7, Pa.

Grade A—Model SCB-2.
Grade B with Grade A Service—Model CIRB.
Service in Philadelphia, Pa.

Smith Detective Agency & Nightwatch Service, Inc., Dallas, Texas.

Grade A. Models AC-4, BAC-51, and GAS-20.
Grade B with Grade A service. Model CA-2B.
Service in Dallas, Texas.

Mercantile Safe and Vault Alarm (42 U3.15)

Systems listed under this heading and in addition systems listed under heading entitled "Bank Safe and Vault Alarm" are suitable for use on mercantile safes and vaults, excepting that sound and vibration detector systems are not considered suitable for non-reverberant vaults unless specifically investigated for such use. Sound detector systems listed for use on fur storage and other highly sound absorptive or non-reverberant vaults have a wide range of sensitivity and are suitable also for use on reverberant vaults.

The extent of protection as applied to central station alarm installations on mercantile safes and vaults is classified as "Complete" or "Partial" protection, as follows:

Complete protection. Protecting with approved devices the top, bottom, all sides, and outer doors of safes or vaults.

Partial protection. Protecting with approved devices the outer doors or lock and bolt mechanism of safes or vaults.

Albany Protective Service, Albany 2, N. Y.

Grade A. Model AL-25CS.
Service in Albany, N. Y.

American Alarm Co., Inc., Indianapolis 4, Ind.

Grade A. Models BCA-155 and PSA.
Service in Indianapolis.

American Fire Dispatch, Inc., Los Angeles 3, Calif.

Grade A. Models DLS-1, Sentinel No. 1 and No. 2, BCA-155, AL-25CS.
Service in Los Angeles, Calif.

Automatic Alarm Corp., Minneapolis 5, Minn.

Grade A. Models BCA-155, PSA.

Call's Central Station Alarms, Chelsea, Boston 50, Mass.

Grade A. Model AL-25CS.
Service in Boston, Mass.

Central Alarm, Phoenix, Ariz.

Grade A. Models CAM-1, VA-300, 325.
Service in Phoenix and Tucson, Ariz.

Central Alarm Co., Ltd., Honolulu 14, Hawaii.

Grade A. Models 100L, PSA, AL-25CS.
Service in Honolulu, Hawaii.

Central Station Alarms, Inc., Shreveport, La.

Grade A, Models SCB-2L, PSA, AL-25CS.
Service in Shreveport, La.

Central Station Signals, Inc., New York 10, N. Y.

Grade A.
Model DCV.
Model AL-25CS, electronic unit for safes.
Service in New York, N. Y.

Central Watch Service, Chicago 10, Ill.

Grade A. Models 2, 25, AL25-CS, and PSA.
Grade B with Grade A service. Model CIRB.
Service in Chicago, Ill.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A. Type 179-M. Phonetalarm Types 1020 and 1024. Telapproach Type 29[illegible]
Grade B with Grade A service, Types 250BX, 7108, Telapproach Type 2920, [illegible] talarm Type 7107.
Service in cities listed under Bank Safe and Vault Central [illegible]

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Burglar Alarm Systems—Central Station—Mercantile Safe and Vault Alarm—*Continued*

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.

Grade A—Models AL25CS and PSA Soundalarm.
Service in Dayton, Ohio.

Denver Burglar Alarm Co., Inc., Denver 5, Colo.

Grade A. Model DBV1.
Service in Denver, Colorado.

Electro-Protective Corp., Newark 4, N. J.

Grade A. Model AL-25-CS.
Service in Newark, N. J.

Federal Engineering Co., Inc., Washington 1, D. C.

Grade A. Model BCA-155, AL-25CS.
Service in Washington, D. C.

Holmes Electric Protective Co., New York 1, N. Y.

Grade A. Models 501, CS1400, and MVS222.
Grade A service in New York, N. Y., Philadelphia, Pa., and Pittsburgh, Pa.

McCane-Sondock Detective Agency & Burglar Alarm Co., Houston 2, Texas.

Grade A. Models A, AL25CS, PSA Soundalarm.
Grade B with Grade A service. Model B.
Service in Houston, Texas.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.

Grade A. Models AL25CS, BCA-155, VP, VPD.
Grade B with Grade A service. Model CIRB.
Service in Milwaukee, Wis.

Metropolitan Electric Protection, New York 1, N. Y.

Grade A. Model 20.
Service in New York City.

Michigan Still Alarm Co., Div. of Michigan Burglar Alarm Systems, Detroit 4, Mich.

Grade A. Model MSA-2L.
Service in Detroit, Michigan.

Morse Signal Devices, Cleveland 3, Ohio.

Grade A. Models B6655, S248, V248.
Grade B with Grade A service. Models B6655-MC, S148, V148.
Service in Cleveland, Ohio and Los Angeles, Calif.

Newark District Telegraph Co., Newark 2, N. J.

Grade A. Models MV, Dynalarm, AL25-CS.
Service in Newark, N. J.

Owl Protective Co., Inc., Philadelphia 7, Pa.

Grade A. Models S, AL-25CS, BCA-155.

Potter Electric Signal Co., Cincinnati 2, Ohio.

Grade A. Model A-2.
Service in Cincinnati, Ohio.

Potter Electric Signal Co., St. Louis 3, Mo.

Grade A. Models A-1, -2, AL25CS, BCA155.
Service in St. Louis, Mo.

Protection Engineering Corp., Los Angeles 44, Calif.

Grade A. Models P-10, P-12, P-14.
Service in Los Angeles, Calif.

Reliance Protective, Inc., Tulsa, Okla.

Grade A—Model SCB-2L.
Service in Tulsa, Okla.

[illegible]land Electric Protective Co., Providence 1, R. I.

[illegible]

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Burglar Alarm Systems—Central Station—Mercantile Safe and Vault Alarm—*Continued*

Robinson Electronic Supervisory Co., Philadelphia 2, Pa.

Grade A. Model AL-25CS.
Service in Philadelphia, Pa.

Smith Detective Agency & Night Watch Service, Inc., Dallas, Texas

Grade A. Models AL25CS, GAS32.
Service in Dallas, Texas.

COMBINATION CENTRAL STATION AND LOCAL (42 U5)

The terms "central station" and "central office" are used interchangeably.

A combination central station and local alarm system is one which is arranged to operate a sounding device on the outside of the building and also transmit a coded signal to a central station in the event of unauthorized opening or operation of electrical protective circuits and devices on the protected property.

Combination systems are usually connected to the central station over a loop circuit which is common to more than one property. The combination of this sort of central station connection and a local gong is classified as the equivalent of an individual line connection. The combination systems are classified as Grade A or Grade B Central Station, depending on the protection service furnished.

Combination Central Station and Local System. Beyond the range of central station service may be classified as a **Local Burglar Alarm System.**

Listed combination central station and local alarm system installations may be identified by the same form of certificate and are subject to the same Laboratories' supervision as described for central station systems.

Bank Safe and Vault Alarm (42 U5.2)

The extent of protection as applied to combination central station and local alarm installations on bank safes and vaults is classified as "Complete" or "Partial" protection as follows:

Complete protection—Protecting with approved devices the top, bottom, all sides, and the outer doors of safes or vaults.

Partial protection—Protecting with approved devices the outer door or lock and bolt mechanism of safes or vaults.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A. Type 5811-830.
Service in cities listed under Bank Safe and Vault Central Station Burglar Alarm Systems.

Holmes Electric Protective Co., New York 13, N. Y.

Grade A. Model H.E.P. 5811-830.
Service in New York, N. Y. Philadelphia, Pa., and Pittsburg, Pa.

Mercantile Premises Alarm (42 U5.13)

Systems listed in the Mercantile Premises classification are considered suitable for protection of mercantile premises and stock rooms but not for protection of safes and vaults.

Systems listed in the classification Mercantile Safe and Vault Alarm may also have premises wiring connected to the same alarm with a separate certificate issued to each class.

The extent of central station alarm protection installed on mercantile premises is classified as Installation 1, 2, or 3 in accordance with the following definitions:

Installation 1—Completely protecting all windows, doors, transoms, skylights, and other openings leading from the premises, and all ceilings, floors, and hall, party, partition, and building walls enclosing the premises, except building walls which are exposed to street or public highway, and except that part of any building wall which is at least two stories above roof of an adjoining building.

Installation 2—Protecting with traps all inaccessible windows, and with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, and protecting all ceilings and floors not constructed of concrete, and all hall, partition, and party walls enclosing the premises, *or*

Protecting with supervisory contacts only all movable openings leading from the premises, and providing a system of invisible radiation to all sections of the enclosed area, so as to detect four-step movement, or

Protecting with traps all inaccessible windows; with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises; and providing a network of invisible beams to subdivide the floor space of each floor or separate section of the protected area into three approximately equal areas, and more where necessary to provide at least one subdivision per 1000 sq ft of floor space.

Installation 3—Protecting with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, or

Protecting with contacts only all movable accessible openings leading from the premises and providing one or more invisible rays or channels of radiation with the [illegible] over-all length of the rays or radiation equivalent to the longest dimensions of [illegible] or areas so as to detect movement through the channel at any point.

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Burglar Alarm Systems—Combination Central Station and Local—Mercantile Premises Alarm—*Continued*

Protecting with contacts all doors leading from the protected area or areas and protecting a system of invisible radiation to all sections of the enclosed area so as to detect four-step movement.

American Fire Dispatch, Inc., Los Angeles 3, Calif.

Grade A. Models T53, 954-955, 1100, 1105, 1300-L.
Service in Los Angeles, Calif.

Automatic Alarm Corp., Minneapolis 5, Minn.

Grade A. Model CIRA.
Service in Minneapolis, Minn.

Central Station Signals, Inc., New York 10, N. Y.

Grade A. Model MCLT.
Service in New York, N. Y.

Central Watch Service, Chicago 10, Ill.

Grade A. Model CIRA.
Service in Chicago, Ill.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A, Type 425-830.
Service in cities listed under Bank Safe and Vault Central Station Burglar Alarm Systems.

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.

Grade A—Model CIRA.
Service in Dayton, Ohio.

Federal Engineering Co., Inc., Washington 1, D. C.

Grade A. Model CIRA.
Service in Washington, D. C.

Granite State Alarm, Inc. Manchester, N. H.

Grade A. Model CIRA.
Service in Manchester, N. H.

Holmes Electric Protective Co., New York 1, N. Y.

Grade A. Model 850. Model HEP#1.
Service in New York, N. Y., Philadelphia, Pa., and Pittsburgh, Pa.

Kedzie Kane Alarm Co., Chicago 12, Ill.

Grade A. Model CIRA.
Service in Chicago, Ill.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.

Grade A. Model CIRA.
Service in Milwaukee, Wis.

Michigan Still Alarm Co., Div. of Michigan Burglar Alarm Systems, Detroit 4, Mich.

Grade A. Model MSA-3A.
Service in Detroit, Michigan.

Morse Signal Devices, Cleveland 3, Ohio.

Grade A. Model B2249.
Service in Cleveland, Ohio and Los Angeles, Calif.

Newark District Telegraph Co., Newark 2, N. J.

Grade A. Model CIRA.
Service in Newark, N. J.

Owl Protective Co., Inc., Philadelphia 7, Pa.

Grade A. Model T53.
Service in Philadelphia, Pa.

Potter Electric Signal Co., Cincinnati 2, Ohio.

Grade A—Model CIRA.
Service in Cincinnati, Ohio.

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Burglar Alarm Systems—Combination Central Station and Local—Mercantile Premises Alarm—*Continued*

Potter Electric Signal Co., St. Louis 3, Mo.

Grade A. Model C1RA.
Service in St. Louis, Mo.

Robinson Electronic Supervisory Co., Philadelphia 2, Pa.

Grade A, Model C1RA.
Service in Philadelphia, Pa.

Smith Detective Agency & Nightwatch Service, Inc., Dallas, Texas

Grade A. Models CA-2, -3.
Service in Dallas, Texas.

Mercantile Safe and Vault Alarm (42 U5.15)

Systems listed under this heading and in addition systems listed under heading entitled "Bank Safe and Vault Alarm" are suitable for use on mercantile safes and vaults, excepting that sound and vibration detector systems are not considered suitable for **non-reverberant** vaults unless specifically investigated for such use. Sound detector systems listed for use on fur storage and other highly sound absorptive or **non-reverberant** vaults have a wide range of sensitivity and are suitable also for use on **reverberant** vaults.

The extent of protection as applied to combination central station and local alarm installations on mercantile safes and vaults is classified as "Complete" or "Partial" protection, as follows:

Complete protection. Protecting with approved devices the top, bottom, all sides, and outer doors of safes or vaults.

Partial protection. Protecting with approved devices the outer doors or lock and bolt mechanism of safes or vaults.

American Fire Dispatch, Inc., Los Angeles 3, Calif.

Grade A. Models BCA-155, AL25CL.
Service in Los Angeles, Calif.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A. Type 1531-830.
Service in cities listed under Bank Safe and Vault Central Station Burglar Alarm Systems.

Holmes Electric Protective Co., New York 1, N. Y.

Grade A. Model HEP#2.
Service in New York, N. Y., Philadelphia, Pa., and Pittsburgh, Pa.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.

Grade A. Models AL25CL, BCA155, C1RA.

LOCAL (42 U12)

A Local Alarm System is one in which the protective circuits and devices are connected to an enclosed and tamper-protected loud sounding device attached to an outside wall of the building in which the property is situated. Disturbance of the protective devices or unauthorized entry through wired portions of the property automatically causes the sounding device to operate until it is stopped by key control in the possession of the owner or by exhaustion of the power supply or by a timing element set for a definite period of operation. These systems are of the low-voltage type, the current being supplied by dry batteries or storage batteries usually not exceeding 24 v.

The operation of a local alarm system is partially under the control and domination of the owner or others interested in the property to be protected. However, it is required that local systems be maintained under the care and inspection service of the installing company. Inspections are made at intervals of one year or less depending on current and power requirements. The installing company is expected to respond to trouble or calls for service not later than the business day following the report of trouble by the user. It is the responsibility of the owner to switch the protection in and off duty and to report improper functioning of the system to the service company.

Local mercantile alarm systems are classified as Grade A or Grade B, according to the degree to which the design is electrically supervised against failure without indication to the owner and to the degree of protection provided against tampering or defeat of the controls and sounding device.

Listed Local Alarm System installations may be identified by a certificate of the form illustrated under headings "Bank Safe and Vault Alarm" and "Mercantile Premises Alarm."

The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field counter check program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

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Burglar Alarm Systems—Local—*Continued*

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements. Inspections and tests are made at factories by the Laboratories' inspectors and cover the design, construction, and wiring of all essential units employed in the system. Particular attention is given to electrical insulation, spacings, contacts, wiring, and other items bearing upon the reliability of operation and protection against tampering.

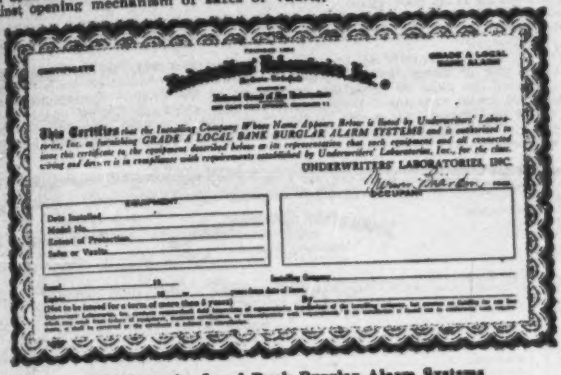
Inspections and tests of representative installations in the field are made to determine the correctness of installation of protective devices and wiring, quality of workmanship, operability of circuits, maintenance and extent of protection applied.

Bank Safe and Vault Alarm (42 U12.2)

The extent of protection as applied to local alarm installations on bank safes and vaults is defined as follows:

Complete System—Protecting with acceptable devices the top, bottom, all sides, and inner doors of safes or vaults.

Partial System—Protecting with acceptable devices the outer door or doors only and only against opening mechanism of safes or vaults.



Certificate for Local Bank Burglar Alarm Systems

Bankers Electric Protective Association, Boston 9, Mass.

Grade A. Models 200, 200R, 5811.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Grade A. Types 200, 200R, 5811.

Diebold, Incorporated, Canton 2, Ohio.

Grade A. Models 114-11, 18, and W.

Federal Alarms, Div. of The Hermann Safe Co., San Francisco 3, Calif.

Grade A. Federal Types ARM and ARM-AC.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Incorporated, Hamilton, Ohio.

Grade A. Model 114-11.

Mosler Safe Co., The, Hamilton, Ohio.

Grade A. Types A-100 and S; Models M and Century.

Padua Alarm Systems, Inc., Cohoes, N. Y.

Grade A. Faraday-Padua Model A.

Protection Equipment Co., Inc., Hopkins, Minn.

Grade A. Model 100.

Mercantile Premises Alarm (42 U12.13)

Systems listed in the Mercantile Premises classification are considered suitable for protection of mercantile premises and stock rooms but not for protection of safes and vaults.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Systems listed in the classification **Mercantile Safe and Vault Alarm** may also have premises wiring connected to the same alarm with a separate certificate issued to each class.

The extent of local alarm protection installed on mercantile premises is classified as Installation 2 or 3 in accordance with the following definitions:

Installation 2—Protecting with traps all inaccessible windows, and with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, and protecting all ceilings and floors not constructed of concrete and all hall, partition, and party walls enclosing the premises, or

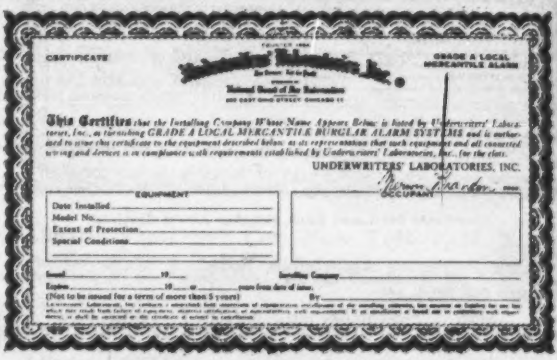
Protecting with supervisory contacts only all movable openings leading from the premises, and providing a system of invisible radiation to all sections of the enclosed area, so as to detect four-step movement, or

Protecting with traps all inaccessible windows; with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises; and providing a network of invisible beams to subdivide the floor space of each floor or separate section of the protected area into three approximately equal areas, and more where necessary to provide at least one subdivision per 1000 sq ft of floor space.

Installation 3—Protecting with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights, and other openings leading from the premises, or

Protecting with contacts only all movable accessible openings leading from the premises and providing one or more invisible rays or channels of radiation with the minimum over-all length of the rays or radiation equivalent to the longest dimensions of the area or areas so as to detect movement through the channel at any point, or

Protecting with contacts all doors leading from the protected area or areas and providing a system of invisible radiation to all sections of the enclosed area so as to detect four-step movement.



CERTIFICATE

GRADE A LOCAL MERCANTILE ALARM

This Certifies that the Installing Company Whose Name Appears Below is listed by Underwriters' Laboratories, Inc., as furnishing *GRADE A LOCAL MERCANTILE BURGLAR ALARM SYSTEMS* and is authorized to issue this certificate to the equipment described below, as its representation that such equipment and all connected wiring and devices is in compliance with requirements established by Underwriters' Laboratories, Inc., for the class.

UNDERWRITERS' LABORATORIES, INC.

EQUIPMENT

Date Installed

Model No.

Extent of Protection

Special Conditions

OCCUPANT

Issued ..... 19.... Installing Company .....

Expires ..... 19.... or ..... years from date of issue.

(Not to be issued for a term of more than 5 years) By .....

Certificate for Grade A Local Mercantile Burglar Alarm Systems

The certificate for Grade B Local Mercantile Burglar Alarm Systems is the same as Grade A except for the grade letter.

A. B. Alarm Co., Cincinnati 19, Ohio.

Grade A. Models A, C.S.

A. B. C. Burglar Alarm Co., Brooklyn 16, N. Y.

Grade A. Ademco Type A.

ABCO Systems, Div. of Active Burglarm Corp., Newark 8, N. J.

Grade A. Ademco Type A.

A.F.P. Co., Chicago 39, Ill.

Grade A. Models AFP13, 955.

Abbott Automatic Alarm, Chicago 32, Ill.

Grade A. Model "Ace H. D."

Ace Alarm Co., Scotia 2, N. Y.

Grade A. Models Ademco Type A, 1300L.

Ace Alarm Co., Inc., Providence 6, R. I.

Grade A. Ademco Type A, IPC48, Model 955.

Ace of Spades Burglar Alarm Co., Pittsburgh 17, Pa.

Grade A. Model Ademco Type A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Acme Burglar Alarm Co., Hempstead, L. I., N. Y.
Grade A. Models Ademco Type A, 1300L, Ace Model A.

Adler Alarm Signal Systems, San Antonio, Texas.
Grade A. Models Ace A and I.P.C. 48A.

Advance Burglar Alarm Systems, Inc., Malverne, N. Y.
Grade A. Models Ace Heavy Duty A, IPC45 and Ademco Type A.

Alarm Signal Co. of Texas, Pasadena, Texas.
Grade A. Models Ademco A, CIRA.

Albany Protective Service, Albany 8, N. Y.
Grade A. Ademco Type A.

Alert Alarms, Lake Zurich, Ill.
Grade A. Model "Ace A" Heavy Duty.

Allied Alarm Systems, Cleveland 6, Ohio.
Grade A Models Ace Heavy Duty, Ademco Type A.

Allied Secret Service, Inc., Mobile, Ala.
Grade A. Models 100, 101, CIRA.

American Alarm Co., Inc., Indianapolis, Ind.
Grade A. Model Ademco Type A.

American Fire Dispatch, Inc., Los Angeles 3, Calif.
Grade A. Types LAC-1, 1300-L.

American Fire & Safety Bureau, Inc., Franklin Park, Ill.
Grade A—Model 101.

Apex Signal Service, Hillside, N. J.
Grade A. Model Ademco Type A.

Armour Burglar Alarm Co., Syracuse 5, N. Y.
Grade A. Ademco Type A.

Arrow Electric Protection Co., Not Inc., Gary, Ind.
Grade A. Models AC and 5009.

Atlantic City Alarm Corp., Atlantic City, N. J.
Grade A. Models Ace Heavy Duty A and CIRA.

Automatic Alarm Corp., Minneapolis 5, Minn.
Grade A. Models Ace Heavy Duty, CIRA, 1100, 1105.

Automatic Alarms Co., Inc., Detroit 6, Mich.
Grade A. Models AAC-1, 955.

Automatic Alarms, Ltd., Div. Merchants Fire Dispatch, Los Angeles 15, Calif.
Grade A. Model AA-14.
Grade B. Model PBA11.

Automatic Burglar Alarm Co., Brooklyn 11, N. Y.
Grade A. Ademco Type A.

Automatic Burglar Alarm Systems, Inc., New Haven 11, Conn.
Grade A. Ademco Type A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Bay Alarm Co., Oakland 6, Calif.
Grade A. Models A-56, B1300L.

Bell Burglar Alarm Co., Eastchester, N. Y.
Grade A. Models Ace Heavy Duty, Ademco Type A, Bell Type A, IPC 48.

Bell Burglar Alarms, Philadelphia 3, Pa.
Grade A. Model Ademco Type A.

Boro Burglar Alarm Co., Brooklyn 19, N. Y.
Grade A. IPC48, Ademco Type A, and 1300L.

Burglar Alarm Engineering Co., The, Woodhaven 21, L. I., N. Y.
Grade A. Ademco Type A.

California Burglar Alarm Co., Redwood City, Calif.
Grade A. Model 100.

Call's Police Signal Corp., Chelsea 50, Mass.
Grade A. Ademco Type A.

Cauley Detective Agency, Pittsburgh 6, Pa.
Grade A. Ademco Type A, IPC Model 48A.

Central Alarm, Phoenix, Ariz.
Grade A. Model CAB-1.

Central Electric Alarms, Brooklyn 7, N. Y.
Grade A. Ademco Type A.

Central Office Alarm Co., Inc., Long Island City 1, N. Y.
Grade A. Models IPC 48, 156, T53.

Central Station Alarm Co., Dallas 1, Texas.
Grade A. Model 2.

Central Station Alarms, Inc., Shreveport, La.
Grade A. Models Ace Heavy Duty A, Ademco Type A.

Central Watch Service, Chicago 10, Ill.
Grade A. Models 1L, CIRA, and 300.

Certified Alarm & Signal Co., Toledo 4, Ohio.
Grade A. Model A-87.

Certified Burglar Alarms, Inc., Brooklyn 25, N. Y.
Grade A. Models Type 1A, Ademco Type A.

Certified Burglar Alarm Systems, Inc., Chicago 22, Ill.
Grade A. Models A-87, 955, 1300L, 1105.
Grade B. Model B-87.

Chicago Mercantile Police Alarm Systems, Chicago 55, Ill.
Grade A. Models A, 955, 1105, 1300L.

Coast Burglar Alarm Co., Los Angeles 27, Calif.
Grade A. Model 100A.

Colonial Burglar Alarm Co., Inc., Passaic, N. J.
Grade A. Ademco Type A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Connecticut Protective System, Inc., New Haven 2, Conn.
Grade A—"Security" Models A-1, A-2; and 955 Ultrasonic System.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.
Grade A. Model No. 425, Types 5814, 2200.
Service nationwide. For list of service centers, refer to the list of cities given under Central Station Grade A Bank Safe and Vault Alarms.

Co-Operative Burglary Protection Co., Chicago 41, Ill.
Grade A. Model 100.
Grade B. Model 100B.

County Burglar & Fire Alarm Corp., Massapequa, L. I., N. Y.
Grade A. Model Ademco Type A.

Damon Alarm Corp., Kansas City 11, Mo.
Grade A. Models A-1, A-2.

Dawn Patrol, Detroit 24, Mich.
Grade A. Models Ace Heavy Duty and Cira.

Day & Night Burglar Alarm Co., San Francisco 24, Calif.
Grade A. Ace Heavy duty Alarm "Model A."

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.
Grade A. Model CIRA and Ace Model D-1.

Denver Burglar Alarm Co., Inc., Denver 5, Colo.
Grade A. Model Ace Heavy Duty.

E. O. Smith Interests, Fort Worth, Texas.
Grade A. Model Ace Heavy Duty.

Eagle Burglar Alarm Corp., Brooklyn 6, N. Y.
Grade A. Type 1A.

Eastern District Burglar Alarm Corp., Brooklyn 8, N. Y.
Grade A. Model Ademco Type A.

Electric Alarm Protection, Inc., New Orleans 21, La.
Grade A. Model Ace Heavy Duty.

Electro Alarm Co., Chicago 40, Ill.
Grade A. Model Ace 101.

Electrolarm Co., Littleton, Colo.
Grade A. Model A.

Electronic Systems, Inc., Akron 2, Ohio.
Grade A. Ace Heavy Duty Model A.

Electro-Protective Corp., Newark 4, N. J.
Grade A. NPC Model A, EPC Model A.

Electro Watchman, Inc., St. Paul 3, Minn.
Grade A. Ademco Type A, Ace Heavy Duty.

Ever Ready Burglar Alarm Systems, Chicago 47, Ill.
Grade A. Model ER7.

[illegible] Burglar Alarm System, Newark, N. J.
Grade A. Models Ademco Type A; 955, Ultrasonic system; 1100, Photoelectric system.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Federal Burglar Alarm Co., Newark, N. J.
Grade A. Model Ademco Type A.

Federal Engineering Co., Inc., Washington 1, D. C.
Grade A. Models Ademco Type A, CIRA and 300.

Florida Patrol System, Tampa, Fla.
Grade A—Model Ace Heavy Duty A.

Fruh & Co., A. W., Chicago 14, Ill.
Grade A. Ace Heavy Duty alarm.

General Burglar Alarm Co., Inc., Long Island City 1, N. Y.
Grade A. Models 48, 156.
Service in New York, N. Y., Newark, N. J. and Philadelphia, Pa.

George Alarm Co., Springfield, Ill.
Grade A. Ace Heavy Duty Model A.

Georgia-Florida Burglar Alarm Co., Thomasville, Ga.
Grade A. Ademco Type A.

Guardian Alarm Co. of Mich., Detroit 6, Mich.
Grade A. Ademco Type A.

Guardian Alarm Service, Div. of American Electrical Corp., Lynn, Mass.
Grade A. Model Ademco Type A.

Hammond Burglar Alarm Service, Union City, N. J.
Grade A. Ademco Type A.

Hawkeye Alarm & Signal Co., Waterloo, Iowa.
Grade A. Ace Heavy Duty Model A.

Holmes Electric Protective Co., New York 1, N. Y.
Grade A. Models 1-SB and 2-SB.

Hyde Park Alarm System, Inc., Boston 26, Mass.
Grade A. Models Ademco Type A, IPC 48A.

Illinois Burglar & Fire Alarm Co., Decatur, Ill.
Grade A. Model L1.

Imperial Alarm Systems, Bellport, L. I., N. Y.
Grade A. Ademco Type A.

Instantaneous Electric Alarm Co., Metuchen, N. J.
Grade A. Models Ademco Type A, 955, 1100, 1300L.

Instant Signal & Alarm Co., Lynn, Mass.
Grade A. Models Ademco Type A, 1300L.

Jackson Patrol Service, Inc., Jackson, Miss.
Grade A. Model Ademco Type A.

Kedzie Kane Alarm Co., Chicago 12, Ill.
Grade A. Models Ace Heavy Duty, CIRA, 1100, 1105, 1300L.

Kidde Ultrasonic & Detection Alarms Div., Walter Kidde & Company, Inc., Clifton, N. J.
Grade A. Models 954; 955 Ultrasonic Systems. Model 1100. Photoelectric System.

Kings Electric & Burglar Alarm Co., Long Beach 5, Calif.
Grade A. Model 48.

Leslie Bureau of Investigation, Nashville 3, Tenn.
Grade A. Ademco Type A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Long Island Alarm Service, Huntington, N. Y.
Grade A. Model Ademco Type A.

McCane-Sondock Detective Agency & Burglar Alarm Co., Houston 2, Texas.
Grade A. Ademco Type A.

Magnetic Alarm Co., Houston 6, Texas.
Grade A. Ademco Type A.

Magnetic Alarm, Div. Newark District Telegraph Co., Newark 2, N. J.
Grade A. Models Ace A, Ademco Type A.

Merchants Burglar Alarm Co., North Easton, Mass.
Grade A. IPC Model 48 A.

Merchants Burglar Alarm Systems, Wallington, N. J.
Grade A. Ademco Type A.

Merchants Police Signal & Alarm Co., Milwaukee 3, Wis.
Grade A. Models 76R, 101, 301.

Merchants Protective Alarm Co., Honolulu, T. H.
Grade A. Ace Model A.

Metropolitan Alarm Service, Cicero 50, Ill.
Grade A. Model A.

Miami Burglar Alarm Co., Miami 35, Fla.
Grade A. Model Ademco, Type A.

Michigan Burglar Alarm Systems, Detroit, Mich.
Grade A. Model Ace Heavy Duty.

Midnight Burglar Alarm System Inc., Flint 3, Mich.
Grade A. Model Ace Heavy-Duty.

Midwest Burglar Alarm Co., Chicago 34, Ill.
Grade A—Model "Ace A."

Mid-Western Alarm Co., Davis Junction, Ill.
Grade A. Ace Model A.
Grade B. Ace Model B.

Monarch Burglar Alarm Co., The, Los Angeles 57, Calif.
Grade A. Models ML-61, 1106, 1300L, 954, 955.

Morefield Co., John A., Camp Hill, Pa.
Grade A. Model 48.

Morse Signal Devices, Cleveland 3, Ohio.
Grade A. Models B-2249, B-3750.
Service in Cleveland, Ohio, Los Angeles, Calif., and San Diego, Calif.

Mossie Alarm Co., Kansas City 1, Mo.
Grade A. M-2, Ademco Type A.

National Burglar Alarm Co., Collingswood, N. J.
Grade A. Ademco Type A.

National Protective Corp., Baltimore 18, Md.
Grade A. NPC Model A, EPC Model A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

New Way Burglar Alarm, Chicago 47, Ill.
Grade A. Model 105A.

New York Merchants Protective Co., Inc., New York 1, N. Y.
Grade A. Models 200-M, Ademco Type A, IPC 45 and IPC48.

Owl Protective Co., Inc., Long Island City 1, N. Y.
Grade A. Models 48, 156, T53; Model No. 2 Ultrasonic System.

Padua Alarm Systems, Inc., Cohoes, N. Y.
Grade A. Ace Heavy Duty Alarm Model A.

Phares Protective Systems, Inc., Austin 13, Texas.
Grade A. Models CIRA and Ademco Type A.

Protection Alarms, Inc., Peoria, Ill.
Grade A. Models Ace A and CIRA.

RPN Alarm Systems, Inc., Melbourne, Fla.
Grade A. Ademco Type A.

Reliance Alarm Co., Detroit 26, Mich.
Grade A. Reliance, Model 524.

Reliance Electric Protective Co., Chicago 4, Ill.
Grade A. Model 524.

Reliance Protective, Inc., Tulsa, Okla.
Grade A. Ademco Type A.

Republic Alarm Co., San Jose 10, Calif.
Grade A. Models A-1, ADM-1, RAC-1, RAC-3, 1300L.

Rhode Island Electric Protective Co., Providence, R. I.
Grade A. Model 425.

Richmond Burglar Alarm Co., Richmond 24, Va.
Grade A. Ademco Type A.

Richmond Burglar Alarm System, Richmond, S. I., 6, N. Y.
Grade A. Model Ademco Type A.

Riverside Detective Agency, Houston, Texas.
Grade A. Model "Ace Heavy Duty."

Robinson Electronic Supervisory Co., Philadelphia 2, Pa.
Grade A. Ademco Type A.

Royal Burglar Alarm Systems, Buffalo, N. Y.
Grade A. Guardian Model 5009, Ademco Type A.

S. D. A. Co., Hillside, Ill.
Grade A. Model Ace Heavy Duty.

San Diego Burglar Alarm Co., San Diego 1, Calif.
Grade A. Models Ace A, 955.

Schirmer-National Alarm Co., Bergenfield, N. J.
Grade A. Models Ademco Type A, 1300L, 2100, 1105, 954, 955.

Security Burglar Alarm Co., Oklahoma City, Okla.
Grade A. Ademco Type A, Model 1300 L.

Security Officer System, Inc., dba Bays Detective Agency, Tulsa, Okla.
Grade A. Ademco Type A.

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Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Security Systems Corp., New Haven 2, Conn.
Grade A. Security Model A-2.

Securotron Corp., Niles 48, Ill.
Grade A, Models Ace 101, 300, 1105.

Smith Detective Agency & Nightwatch Service, Inc., Dallas, Texas.
Grade A. Model CA-2.

Southern Burglar Alarm Co., Belton, S. C.
Grade A. Ademco Type A.

Southern Burglar Alarm Co. of Ga., Inc., Atlanta 3, Ga.
Grade A. Model Ademco Type A.

Southern Burglar Alarm Co. of Va., Inc., Norfolk, Va.
Grade A. Ademco Type A.

Standard Alarm Co., Inc., Los Angeles 19, Calif.
Grade A. Model 350.

Standard Burglar Alarm Co., Chicago 14, Ill.
Grade A. Model A-54.
Grade B. Model B-26.

Stanley Alarm System, Div. of Michigan Sound & Engineering Co., Bay City, Mich.
Grade A. Model 101.

Star Protection Co., Inc., New York 21, N. Y.
Grade A.
Models Ademco Type A, Guardian 5009, IPC 48A.

State Alarm Co., Youngstown 12, Ohio.
Grade A. Model Ace Heavy Duty.

Supreme Burglar Alarm Co., Hillside, N. J.
Grade A. Ademco Type A.

Supreme Burglar Alarm Corp., New York 16, N. Y.
Grade A. IPC 48 and Ademco Type A.

Techni-Services, Inc., West Palm Beach, Fla.
Grade A. Ademco Type A.

Thompson Signal Devices, Inc., Brooklyn 20, N. Y.
Grade A. Models Ademco Type A, 1300L, IPC 156.

Triboro Burglar Alarm Co., New York 2, N. Y.
Grade A. Ademco Type A. IPC Model 48A.

United States Burglar Alarm Co., Inc., Los Angeles 15, Calif.
Grade A. Models 530, 955.

Valley Burglar & Fire Alarm Co., Fresno 2, Calif.
Grade A. "Vabco Ace Heavy Duty Alarm," "Ademco Type A," 1100, 1300-L.

Victor Burglar Alarm Co., Inc., Clifton, N. J.
Grade A. Models Ademco Type A, 955, 1100, 1300L.

Victor Burglar Alarm System, Chicago 29, Ill.
Grade A. Model 10.

West Coast Alarm System, Los Angeles 37, Calif.

TED CLOSE TO EDGE

Burglar Alarm Systems—Local—Mercantile Premises Alarm—*Continued*

Wilco Alarms, Inc., Kansas City 13, Mo.
Grade A. Ace Heavy Duty Model A, CIRA.

Wisconsin Guardian Burglary Protection Co., Milwaukee 9, Wis.
Grade A. Mangold Models 5009 and 5010.

World Electric Protection Co., Inc., Brooklyn 26, N. Y.
Grade A. Ademco Type A.

Mercantile Safe and Vault Alarm (42 U12.15)

Systems listed under this heading and, in addition, systems listed under heading entitled "Bank Safe and Vault Alarm" are suitable for use on mercantile safes and vaults, excepting that sound and vibration detector systems are not considered suitable for mercantile application unless specifically investigated for such use and covered by a separate listing in the Mercantile Safe and Vault Alarm section.

The extent of protection on safes is classified as "Complete" or "Partial" protection as follows:
Complete Protection—Protecting with approved devices the top, bottom, all sides, and outer doors of safes or vaults.
Partial Protection—Protecting with approved devices the outer doors or lock and bolt mechanism of safes or vaults.

Arrow Electric Protection Co., Not Inc., Gary, Ind.
Grade A. Model 101SV.

Atlantic City Alarm Corp., Atlantic City, N. J.
Grade A. Models 400, 101 SV.

Bay Burglar Alarm Co., Oakland 6, Calif.
Grade A. Model S-59.

Central Alarm Co., Ltd., Honolulu, Hawaii.
Grade A. Model 400.

Central Office Alarm Co., Inc., Long Island City 1, N. Y.
Grade A. Model 400.

Central Watch Service, Chicago 10, Ill.
Grade A. Model 400.

Certified Burglar Alarm Systems, Inc., Chicago 22, Ill.
Grade A. Model BCA-155.

Controlled Companies of American District Telegraph Co., New York 13, N. Y.
Grade A. Model 1531-A.

Diebold, Incorporated, Canton 2, Ohio.
Grade A. Model 114-10.

Electronic Systems, Inc., Akron 2, Ohio.
Grade A. Model 400.

Electro-Protective Corp., Newark 4, N. J.
Grade A. Model AK.

Federal Engineering Co., Inc., Washington 1, D. C.
Grade A. Model 400.

Fruh & Co., A. W., Chicago 14, Ill.
Grade A. Model 101SV.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Incorporated, Hamilton, Ohio.
Grade A. Model 114-10.

Holmes Electric Protective Co., New York 1, N. Y.
Grade A. Model LCS-1410.

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Burglar Alarm Systems—Local—Mercantile Safe and Vault Alarm—*Continued*

Hyde Park Alarm System, Inc., Boston 26, Mass.
Grade A. Model 400.

Mosler Safe Co., Hamilton, Ohio.
Grade A. Model 400.

Owl Protective Co., Inc., Long Island City 1, N. Y.
Grade A. Model 400.

Protection Alarms, Inc., Peoria, Ill.
Grade A. Model 1018V.

Reliance Alarm Co., Detroit 26, Mich.
Grade A. Model 1531-A.

Republic Alarm Co., San Jose 10, Calif.
Grade A. Model RAC-2.

Securotron Corp., Niles 48, Ill.
Grade A. Model 400.

GAS AND CHEMICAL SYSTEMS (140 A0)

Gas and Chemical Systems are required to be installed and maintained by the manufacturer. These systems are investigated as to reliability of operation, effectiveness, stability, and safety with respect to fire, explosion, and accident hazards.

These systems utilize tear gas and fog which are temporary irritants, but only moderately toxic, and unlikely to cause permanent injury to persons exposed for short durations to concentrations encountered in normal use.

Gas systems within vaults are required to have a luminous caution sign with directions for use of a safety device to prevent discharge of gas which is hazardous to persons if locked or confined in a vault.

The gas may hamper fire fighters to the extent of requiring use of gas masks.

Gas systems designed for protection of safes or vaults against burglary are classified as Complete or Partial, depending upon the extent of protection. The attachment of these devices to safes, insulated cabinets, and vault doors bearing the Laboratories' Fire Classification labels may impair the fire-retardant properties. Such installations should, therefore, be made at the factories where the safes, cabinets, or doors are manufactured. Gas systems designed for use in banks, pay offices, and the like for protection against interior robbery are eligible for certification as complete only where installed to cover completely the premises at individual locations.

Listed Tear Gas System installations may be identified by a certificate of the form illustrated.

CERTIFICATE

GAS PROTECTION SYSTEM

This Certifies that the Installing Company Whose Name Appears Below is listed by Underwriters' Laboratories, Inc. as furnishing *GAS PROTECTION SYSTEMS* and is authorized to issue this certificate to the equipment described below as its representation that such equipment and all connected wiring and devices is in compliance with requirements established by Underwriters' Laboratories, Inc., for the class.

UNDERWRITERS' LABORATORIES, INC.

EQUIPMENT

Date Installed

Model No.

Class

(Gives Partial Safe, Partial Vault or Complete Robbery)

Remarks

OCCUPANT

Issued 19

Installing Company

Expires 19 or years from date of issue.

(Not to be issued for a term of more than 3 years)

By

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements. If no certificate is listed now in conformity with requirements, it shall be invalid as of the conditions or failure to conform.

Certificate for Gas Protection System

The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field counter check program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements.

Inspections and tests are made at factories by the Laboratories' inspectors and cover the design, construction, and assembly of all essential apparatus. Particular attention is given to chemical charges, gas discharge devices and operating controls.

TED CLOSE TO EDGE

Gas and Chemical Systems—*Continued*

Inspections and tests of representative installations are made to determine correctness of installation and interconnection of various parts, location and spacing of gas discharge units and controls, and completeness of the protection applied.

FOR INTERIOR ROBBERY (140 A0)

Robbery—Reexamination and Certificate Service

Anakin-Pro-Tex Div. of The Lake Erie Chemical Co., Cleveland 14, Ohio.

Model 32A, consisting of gas guns connected mechanically to hand and foot controls by means of flexible steel cables through master and intermediate release units maintained under constant tension. Systems inspected and gas charges renewed at intervals not exceeding three years.

Marking: Name and address of manufacturer and Model 32A appear on the master release cover.

Federal Laboratories, Inc., Saltsburg, Pa.

Model RS. Consists of gas guns connected electrically in series multiple in a fully supervised circuit to primary batteries and control units so that a cloud of incapaciting gas may be discharged instantly by the operation of a single hand or foot control.

Federal fog guns may be installed in connection with gas guns where desired.

Systems are inspected annually by the manufacturer and gas charges renewed at intervals not exceeding three years.

Marking: The main control cabinet is marked with the manufacturer's name and address and model designation of the system. A numeral after model number may be used to indicate maximum permissible gas units.

FOR SAFES (140 A0)

Burglary—Reexamination and Certificate Service

Anakin-Pro-Tex Div. of The Lake Erie Chemical Co., Cleveland 14, Ohio.

Model 40. A system of tension wires, combination attachments, and firing mechanism for installation on all types of safes (with the exception of fur safes) having provision for storing delicate mechanism in practically gas-tight containers. Designed to release tear gas in the event of burglarious attack on the combination lock. Gas charges shall be renewed at least once every three years.

Classified as partial protection for safes.

Marking: A brass name plate bearing the listee's name and model designation of the system.

Federal Laboratories, Inc., Saltsburg, Pa.

Federal Model DY. A system of tension wires, combination attachments, shearing devices and firing mechanism for installation on safes.

Federal Model E. A system of twin primer holder and striker bar for installation on safes.

The above systems are for use on all types of safes (with the exception of fur safes) having provisions for storing delicate mechanism in practically gas-tight containers. Designed to release tear gas in the event of burglarious attack on the combination lock. Gas charges shall be renewed at least once every three years.

Classified as partial protection for safes.

Marking: A brass name plate bearing the manufacturer's name and address and the model number of the system.

FOR VAULTS (140 A0)

Burglary—Reexamination and Certificate Service

Anakin-Pro-Tex Div. of The Lake Erie Chemical Co., Cleveland 14, Ohio.

"Model 29" Lake Erie Chemical Warfare gas and Anakin locks. A system of tension wires and combination attachment for installation on the interior of light vault doors, or a system of tension wires and thermostats on vault doors 4 in. or more in thickness, used in connection with labeled relocking device which aligns with gas shells and firing mechanism mounted in the vault vestible. Designed to relock door and release gas within the vault if burglarious attack is made at any point on vault door.

Classified as partial protection.

Marking: Listee's name and model designation on metal plate.

HOLDUP ALARM SYSTEMS (160 O0)

Holdup Alarm Systems are low-voltage electrical signaling systems designed to provide means for calling help from outside stations in event of interior robbery of premises. Such systems are classified as **manual** or **semiautomatic** according to the method of operation and scope of protection installed.

The protective systems may be connected to an independent fully manned [illegible] station, to a municipal police station with facilities for wireless communication to cruising police cars, or to two or more nearby places designated [illegible]

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Holdup Alarm Systems—*Continued*

stations. The choice of stations to which an alarm signal will be transmitted depends somewhat upon the character of central station, police station, or vigilante organization available in the given town, city or district. Such stations should be selected with proper regard to the recommendations of underwriting authorities and to the responsibility which the protected institution cares to assume for conduct of privately instructed and armed individuals responding to an alarm.

Systems of this class are required to be maintained under the care and inspection service of the installing company.

Listed holdup alarm system installations may be identified by a certificate of the form illustrated below.

CERTIFICATE

HOLDUP ALARM AND PROTECTION SYSTEM

This Certifies that the Installing Company Whose Name Appears Below is listed by Underwriters' Laboratories, Inc. as furnishing HOLDUP ALARM AND PROTECTION SYSTEMS and is authorized to issue this certificate for the equipment described below as its representation that such equipment and all connected wiring and devices is in compliance with requirements established by Underwriters' Laboratories, Inc., for the class.

UNDERWRITERS' LABORATORIES, INC.

By _____ Manager

OCCUPANT

EQUIPMENT

Date Installed _____

Model No. _____

Class _____ (Grade if more than one)

Remarks _____

Installing Company

Issued _____ 19__ at _____

Expires _____ 19__ or _____ years from date of issue.

By _____

Certificate for Holdup Alarm Protection System

The certificate serves as evidence that the installing company (1) is listed as furnishing protective systems of the class, type, and grade indicated; (2) is authorized to issue the certificate to the installation as its representation that the equipment is in compliance with requirements established by Underwriters' Laboratories, Inc. for the class; and (3) is subject to the Laboratories' field counter check program whereby periodic inspections are made of representative installations and at the factory to verify the correctness of certification practices.

Underwriters' Laboratories, Inc. assumes no liability for any loss which may result from failure of equipment, incorrect certification, or nonconformity with requirements.

Inspections and tests are made at factories by the Laboratories' inspectors and cover the design, construction, and wiring of all essential units employed in the system. Particular attention is given to electrical insulation, spacings, contacts, wiring, and other items bearing upon the reliability of operation and protection against tampering.

Inspections and tests of representative installations are made to determine the correctness of installation of protective devices and wiring, quality of workmanship, operability of circuits, maintenance, and extent of protection applied.

MANUAL ALARMS (160 O13)

A manual holdup alarm system is one in which the origination of a call for help depends solely on operation of conventional manually operated or foot operated switches installed within the working quarters.

A manual system is intended primarily for application to mercantile or financial institutions having low counters or other fixture arrangements not readily adaptable to semiautomatic or more complete attachments.

It is required that the alarm switches be installed in cages where money and securities are handled, at strategic points along open counters, adjacent to officers commanding a view of the public space and at such other locations as will provide for convenient operation during an attack without fear of attracting attention of the attacking party.

Robbery—Reexamination and Certificate Service

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Type 1500. An electrical signaling system comprising manually operated alarm initiating devices connected to two vigilante stations, a listed central station, or a police station equipped for broadcasting calls to cruising squad cars.

Marking: Name and address of operating company and model number appear on the control cabinet.

Dayton Electronics Alarm & Signal, Inc., Dayton 2, Ohio.

Model HUT-B, No. 126. An electrical signaling system comprising manually operated alarm initiating devices connecting to a listed central station.

Marking: Metal name plate on control units bearing listee's name and model designation.

Diebold, Incorporated, Canton 2, Ohio.

[illegible] 114-27. An electrical signaling system comprising manually operated alarm [illegible] devices connected to a police station or two or more vigilante stations. Multiple [illegible] accommodate seven or more subscribers in units of seven or fourteen.

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Holdup Alarm Systems—Manual Alarms—*Continued*

Systems maintained under care and inspection service of installing company. Intended for use in mercantile premises and financial institutions for protection against interior robbery.

Marking: Metal name plate on control units bearing listee's name and model designation.

Fruh & Co., A. W., Chicago 14, Ill.

Model 150. An electrical signaling system comprising manually operated alarm initiating devices connected to a police station or two or more vigilante stations.

Marking: A metal name plate on the control unit bears the manufacturer's name and model designation.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Incorporated, Hamilton, Ohio.

Model 114-17. An electrical signaling system comprising manually operated alarm initiating devices connected to a police station or two or more vigilante stations. Multiple installations will accommodate seven or more subscribers in units of seven or fourteen.

Marking: Metal name plate on control units bears listee's name and model designation.

Protection Equipment Co., Inc., Hopkins, Minn.

Model 10. An electrical signaling system comprising manually operated alarm initiating devices connected to a police station or two vigilante stations.

Marking: Metal name plate on control units bears listee's name, address, and model designation.

SEMIAUTOMATIC ALARMS (160 O19)

A semiautomatic holdup alarm and protection system is one in which the origination of a call for help does not depend solely on operation of conventional manually operated or foot operated switches located within the employer's working quarters. Semiautomatic attachments are required in the form of currency traps in cash drawers, special locks and contacts on cage entrance doors and automatic door closers. The partition between the public space and work space is equipped so that an alarm will be initiated automatically if robbers attempt to climb over the fixture.

Robbery—Reexamination and Certificate Service

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Type 1500. An electrical signaling system comprising an automatic cage, coping rail protection, either photo electric or trap wire, cash drawer buttons, and lobby door contacts connected through suitable control apparatus to two or more vigilante stations, a listed Central Station or to a police station equipped for broadcasting calls to cruising squad cars.

Marking: Name and address of operating company and model number appear on the control cabinet.

Diebold, Incorporated, Canton 2, Ohio.

McClintock Model 35A. An electrical signaling system comprising apparatus to control and supervise entrances, manual and semiautomatic alarm initiating devices, and overhead tension wire connected to two or more vigilante stations.

Systems maintained under contract and inspected at least annually.

Intended for use in banks, pay offices, and the like for protection against interior robbery.

Marking: Metal name plate on control cabinet bearing the listee's name and model number.

LOCKS (241 O0)

COMBINATION LOCKS (241 O3)

Combination locks are intended for use on chests, safes, and vault doors to provide means of locking the bolt work against unauthorized opening.

Combination locks are investigated primarily for correctness of design and accuracy of construction to guard against manipulation of the combination by sense of sight, touch, or hearing. Combination locks do not necessarily have built-in protection against entry by force, which protection depends largely on the construction of the safe or vault door on which the lock is installed.

Combination locks may be of the hand-change or key-change type. The key-change type enables the owner to change the combination setting readily without opening the lock case. It is important that locks be set on a combination of numbers individual to each safe rather than on a common factory setting.

Combination locks are classified as Group 1, Group 1R, or Group 2 according to the degree of protection afforded against manipulation, number of combination settings provided, and uses for which judged suitable as follows:

Group 1 combination locks are highly resistant to expert or professional manipulation. The protection against expert manipulation includes closed cams, notched tumblers, extra levers, or other advanced design features not found in conventional designs. Group 1 locks are considered suitable for use on burglary-resisting safes and chests such as Class TRTL-30, -60, TXTL-60 and on vaults.

Group 1R combination locks afford protection against expert or professional manipulation by any means including radiological methods. Group 1R locks are considered suitable for use on safes, security files, and vaults where the highest degree of protection is required.

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Locks—Combination Locks—*Continued*

Group 3 combination locks are resistant to semiskilled manipulation. Group 2 combination locks are considered suitable for use on Class T-20 tamper-resistant doors, insulated record containers and light vault doors.

Combination locks are capable of withstanding ordinary wear and tear, corrosion, and rough usage for an extended period of service, normally without attention. They should not be lubricated except at the factory or by experts trained in care and inspection of such locks.

Consult the classification entitled "Time Locks" for devices which afford protection against robbery as well as burglary.

Combination Locks, Group I (241 03.1)

LOOK FOR THE LABEL

Combination locks listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label attached to each device. The label reads: "Underwriters' Laboratories, Inc. Inspected Combination Lock. Group I."

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of design, construction, materials, assembly, and operation. Particular attention is given to manipulation resistant features, tolerances, and protective finish.

Burglary– Label Service

Diebold, Incorporated, Canton 2, Ohio.

Three-wheel tumbler, key-change combination locks.

Mosler Lock Co., Inc., The, Milford, Ohio.

Three-tumbler wheel, hand- or key-changing, combination locks with special linkage to control an angle bar and secure lock bolt, or lock with fence held out of contact by a push-pull dial and special cam to resist expert manipulation.

Mosler Safe Co., The, Hamilton, Ohio.

Four-tumbler and three-tumbler hand-change or key change combination lock.

Sargent & Greenleaf, Inc., Rochester 21, N. Y.

Three-wheel tumbler, hand-change and key-change combination locks.

Yale & Towne Mfg. Co., The, White Plains, N. Y.

Three- and four-wheel, hand-changing, combination lock with locking pawl held out of contact by supplemental lever until all wheels are properly aligned and tumbler disposal feature to resist expert manipulation.

Combination Locks, Group 1R (241 03.1R)

LOOK FOR THE LABEL

Group 1R combination locks are listed under the Label Service of Underwriters' Laboratories, Inc. Each listed device bears a label reading "Underwriters' Laboratories, Inc. Inspected Combination Lock. Group 1R."

The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc., to identify devices and materials which have been produced under its Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of design, construction, materials, assembly, and operation. Particular attention is given to manipulation resistant features, tolerances, and protective finish.

Burglary—Label Service

Mosler Safe Co., The, Hamilton, Ohio.

Four-wheel, hand-change combination locks.

Sargent & Greenleaf, Inc., Rochester 21, N. Y.

Three-wheel, hand-change combination locks.

Combination Locks, Group 2 (241 03.2)

LOOK FOR THE LABEL

Combination locks listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label attached to each device. The label reads: "Underwriters' Laboratories, Inc. Inspected Combination Lock. Group 2."

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of design, construction, materials, assembly, and operation. Particular attention is given to manipulation resistant features, tolerances, and protective finish.

Burglary—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Three-wheel key-changing, combination lock. Four-wheel key-changing, combination

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Locks—Combination Locks—Group 2—*Continued*

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Three-wheel, key changing combination lock with relocking mechanism.

Mosler Lock Co., Inc., The, Milford, Ohio.

Three-wheel, key-changing, combination locks. Four-wheel key-changing, combination lock. Three-wheel, hand-changing, combination locks. Four-wheel, hand-changing, combination lock.

Sargent & Greenleaf, Inc., Rochester 21, N. Y.

Four-wheel hand-changing. Three-wheel hand-changing. Three-wheel key-changing. Four-wheel key-changing.

LOCKING CYLINDERS (241 O12)

Reexamination Service

Chicago Lock Co., Chicago 14, Ill.

Ace 4901-4930 incl. Lock cylinder employing three dual, one mushroom, and three plain pin tumblers; designed to prevent operation of the locking device except by the use of proper key.

Marking: Ace and number designation stamped on the barrel. When a suffix letter is added it will designate a modified assembly as required.

LOCKS FOR SAFE DEPOSIT BOXES (241 O20)

Locks of the two-key, plate-tumbler type are designed for use on safe deposit boxes, collection safes, and the like where a high degree of resistance to theft, unauthorized entry, and robbery is the prime object. Such locks require the use of both a proper guard key and an individual customer's key for normal release of locking bolt.

Safe deposit locks are available in various ranges of possible key changes and some have sealed change keys from which the renter may select a key. Selection of the type of lock, therefore, depends on the number of deposit boxes at a given location and mode of operation desired to afford greatest protection both to the customer and deposit company.

Two-key locks do not necessarily embody inherent protection against punching, drilling, and other burglarious means. Such protection depends upon the method of installation and design of door and boxes so equipped. Also, the locks should be considered as complementary to, not substitutes for, combination locks listed under a separate classification.

Theft—Reexamination Service

Diebold, Incorporated, Canton 2, Ohio.

Types 600, 601, 602, 603, 605, 608, 611, 630, 631, 632, 633, 650, 175-05, and 175-10, also key change Types 400, 402, 405, 430, and 432. Consist of locking bolt mounted in case with two sets of plate tumblers. One set of tumblers operated by guard key other set by customer key. Operation of both sets of tumblers necessary to control the bolt. Possible key changes—15,625 to 823,543 customer key changes, and 64 to 16,384 guard key changes depending on number of tumblers and key cuts.

Designed for use on safe deposit boxes to prevent access to boxes except by use of proper keys.

Marking: "Diebold" in a shield and type number on lock case or cover.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Types H004, H004C, -CC, H14, H14C, -CC, H24, H24C, -CC, H34, H34C, -CC, H614, H614C, -CC, RYS002, RYS002C, -CC, also key change, Types H610CC and SN610C. Possible key changes—15,625 to 78,125 customer key changes, and 64 to 16,384 guard key changes depending on number of tumblers and key cuts.

Marking: Type number stamped on the lock case and HHMCO., is stamped on the keys.

Mosler Lock Co., Inc., The, Milford, Ohio.

Type M-4200 has 46,000 customer key changes and 2,184 guard key changes; Types M-5600, -5700, -5700-K, 823,543 customer and guard key changes; 57570 has 15,625 customer key changes and over 4,000 guard key changes; also key change Types M-5800, -5900, and PK-5900 have 823,543 customer key changes and over 10,000 guard key changes; Type M-7000, over 15,000 customer key changes and over 3,125 guard key changes; Type P59000, over 65,000 customer key changes and over 625 guard key changes.

Marking: Listee's name and type designation stamped in upper left corner of cover plate.

Sargent & Greenleaf, Inc., Rochester 21, N. Y.

Types 165, 165G, 165GG, 166, 166G, and 166GG have 5 customer tumblers with 16,807 possible key changes and 3 guard tumblers with 343 key changes.

Types 4420, 4420G, 4420GG, 4440, 4440G, 4440GG, 4480, 4480G, and 4480GG have 6 customer tumblers with 117,649 possible key changes and 5 guard tumblers with 16,807 key changes. Operation of both sets of key tumblers necessary to unlock bolt.

Designed for use on safe deposit boxes to prevent unauthorized access to boxes.

Marking: Listee's name, address, and catalog number stamped on disc on lock cover.

Yale & Towne Mfg. Co., White Plains, N. Y.

Types B201, B301, B231, and B331 with or without the following suffixes: [illegible] HC, HW, HWC, W, WC, and WWC. Possible key changes—46,656 [illegible] 256 guard changes.

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Locks—*Continued*

TIMELOCKS (241 0201)

LOOK FOR THE LABEL

Delayed Action Timelocks for protection against robbery may be classified as to operation into two groups, depending on whether the mechanism is automatic in operation and setting or provides for manual setting at the will and convenience of the user. Automatic devices are generally factory adjusted to a fixed minimum time delay, whereas manual devices may be varied by the user to the desired delay at each winding.

The ability of a timelock to function continually and reliably for long periods of time depends on many factors, such as character of design, construction, installation, care, and inspection service. Where greater assurance of ability to unlock is desired, devices having double and even triple timer movements or power sources are available. Also, certain types of locks may be recommended and guaranteed by the manufacturer for some applications but not for others.

All timelocks should be under the care and inspection service of the manufacturer or organization recommended by him.

Timelocks should be selected with proper regard to their use, operation, and application as indicated in the foregoing.

For protection against interior robbery unless otherwise indicated.

Delayed Action Timelocks are listed under the Label Service of Underwriters' Laboratories, Inc.

Each listed device of this class bears a label as illustrated.

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program. Inspections at the factory include countercheck of design, construction, materials, and assembly with performance tests to check starting, accuracy, and minimum time delay.

Burglary and Robbery—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Automatic. "Diebold." Jewel-bearing, dual escapement and balance wheel, single, spring-powered clock mechanism.
"Diebold No. 945." Double non-jeweled movement, non-compensating balance wheel escapement; spring-powered clock mechanisms.

Manual. "Diebold Dialock." Single movement spring-powered clock mechanism, exterior mounted type.

Normal opening period of these locks limited to 3 min at expiration of 15 to 30-min time delay.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Manual. Single-movement, spring-powered, nonjeweled clock mechanism. Knob wind provides for 15-, 20-, or 25-min delay. For protection against interior robbery.

Meilink Steel Safe Co., Toledo, Ohio.

Automatic. Delayed action timelock driven by 110-V, a-c, synchronous motor that closes contacts that energize a solenoid-operated lock bolt. Minimum time delay 15 min and an open period of approximately 3 min. Controlled by a listed combination lock.

Mosler Safe Co., The, Hamilton, Ohio.

Automatic Model EDC delayed action timelocks driven by a single 24-v, a-c synchronous motor supplied with transformer for connection to 110-v, a-c circuits; controlled by special combination lock.

Automatic Model FB timelock driven by a single 12-v, a-c synchronous motor supplied with transformer for connection to 110-v, a-c circuits; controlled by a special key-locked bolt throw knob. Interruption of electric current automatically resets device to the full time delay.

Automatic Model DCR dual 72- or 120-hr jeweled movements controlling release mechanism. Automatic winding controlled by special combination lock. Supplied with or without relocking feature.

Automatic Model KCDC identical with Model DCR except that combination change is accomplished by key instead of hand, and relocking feature has been omitted.

Model ABT dual 72- or 120-hr jeweled movements controlling release mechanism. Winding controlled by exterior knob. Automatic when used in place of a combination lock. For protection against burglary and interior robbery.

Model Do-All dual 72- or 120-hr jeweled movements; delayed action periods controlled by exterior operating knob; longer periods by key winding. Automatic when relock control lever is omitted. For protection against burglary and interior robbery.

Model DC dual 72- and 120-hr jeweled movements; delayed action periods controlled by combination lock; longer periods by key winding. Delayed action period may be eliminated on this model. For protection against burglary and interior robbery when delayed action pin is removed.

NITED CLOSE TO EDGE

Locks—Timelocks—*Continued*

Model 3MDR dual nonjeweled movements, noncompensating balance wheel escapement; spring-powered clock mechanism. Automatically controlled by a special key-locked bolt throw knob. Normal operation 15 min time delay.

With the exception of the Model FB, the Model DCR when not provided with relocking feature, and the Model KCDC, all locks automatically reset 5 to 7 min after expiration of the time delay period.

Yale & Towne Mfg. Co., The, Stamford, Conn.

Automatic. "Model DWC". Double-movement, balance wheel escapement, jewel-bearing movements; for protection against robbery.

Manual. "Models D2, DN2, D2C, and DC". Double-movement, balance wheel escapement, jewel-bearing movements; for protection against robbery.

Manual. "Models DN3 and DN3C". Triple-movement, balance wheel escapement, jewel-bearing movements; for protection against burglary and robbery.

MESSENGER BAG (540 I0)

LOOK FOR THE LABEL

Messenger Protection Bags are listed under the Label Service of Underwriters Laboratories, Inc.

A label reading "Underwriters' Laboratories, Inc. Inspected Messenger Protection Bag Serial No. ....." is attached to name plate on interior frame of each listed bag.

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of materials, precision, and workmanship, and operation test of working mechanisms and safety appliances as well as discharge and special tests of shells selected from stock.

Robbery—Label Service

Darworth Inc., Bankers Protection Div., Simsbury, Conn.

A mesh-lined leather bag containing mechanism which automatically locks the bag, produces a series of detonations to attract attention, and emits streams of tracer smoke to assist pursuit if the bag is snatched from its carrier.

Intended for use in the transportation of money or securities in cities for protection against messenger robbery.

PARKING METERS (320 A0)

LOOK FOR THE LABEL

A parking meter is a device designed primarily for use by municipalities to regulate parking time on public streets or for commercial use on privately owned parking lots. The meter should be securely mounted on a galvanized 2-in. pipe embedded in the concrete sidewalk or pavement.

Parking meters are designated as manual wind or automatic, single- or twin-space and single or multiple-coin types. They are available in time ranges from ½ hour to 24 hours and in a variety of multiple coin combinations.

Parking meters are examined primarily for strength of the coin compartment to resist forcible entry, theft resistance and reliability of the timer mechanism to withstand out-of-door service conditions without significant variation in time metering.

Since parking meters are powered by spring-wound timer mechanism, it is recommended that the timer be serviced regularly, at least once a year.

It is customary to adjust the mechanism so that the parker will receive not less than the time paid for and not more than 3 minutes free time per hour.

It is recommended that for maximum security, the number of parking meter coin compartments operable by the same collector's key should be restricted to 200 or less. Timer compartments may be locked by keys with identical bitting to facilitate servicing.

Parking meters are listed under the Label Service of Underwriters' Laboratories, Inc. Each listed device bears a label reading "Underwriters' Laboratories, Inc. Inspected Parking Meter." Each listed timer mechanism bears a label reading "Underwriters' Laboratories, Inspected Mechanism, for use with labeled parking meters."

The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service program.

Inspections at the factory include countercheck of design, construction, materials, assembly and performance tests to check accuracy and reliability of the timer mechanism.

Label Service

Duncan Parking Meter Div. of Motor Products Corp., Chicago 22, Ill.

Parking Meters—Manually operated parking meters designed for municipal or private use in outdoor parking facilities or on streets to regulate parking time.

RELOCKING DEVICES (362 E0)

LOOK FOR THE LABEL

Relocking devices are intended to operate and relock the original boltwork or to relock the door by the functioning of auxiliary bolts in the event of burglarious attack upon the door. The attachment of these devices to safes, insulated cabinets, and vaults bearing Fire Classification labels of Underwriters' Laboratories, Inc. [illegible] fire retardant properties. Such installations should, therefore, be [illegible] where the safes, cabinets, or doors are [illegible]

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Relocking Devices—*Continued*

When properly installed, relocking devices listed herein are capable of operating as a result of burglarious attempts as set forth below for different applications. These devices normally should require no attention for extended periods of service. If alterations or repairs become necessary they should be made by the manufacturer under whose direction the device was originally installed.

The devices, which are installed as standard equipment on heavy vault doors having an offset spindle construction or the equivalent protection against punching or blowing the combination lock, shall operate and securely relock the boltwork before an opening of sufficient size is made through the door by means of an oxy-acetylene torch, or by torch and drills to release the original lock connection.

Relocking Devices listed under the Label Service of Underwriters' Laboratories, Inc., may be identified by a label attached to each device. The Label reads: "Underwriters' Laboratories, Inc. Inspected Relocking Device."

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of design, construction, materials, assembly, and operation. Particular attention is given to strength of parts, fitting tolerances, fusible elements, if any, and to protection against corrosion.

FOR SAFES OR CHESTS (362 E19)

The device shall operate and securely relock the door or boltwork of safes or chests when the combination is punched or blown.

Burglary—Label Service

Anakin-Pro-Tex Div. of The Lake Erie Chemical Co., Cleveland 14, Ohio.

Diebold, Incorporated, Canton 2, Ohio.

Gary Safe Corp., Los Angeles 21, Calif.

Gross-Feibel Co., The, Hillsboro, Ohio.

Guardian Burglar Proof Equipment Co., The, Cleveland 13, Ohio.

Hermann Safe Co., The, San Francisco 3, Calif.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Johnson-Pacific Safe Co., Richmond 4, Calif.

McGunn Time Lock & Safe Co., Chicago 7, Ill.

Major Safe Co., Los Angeles 23, Calif.

Meilink Steel Safe Co., Toledo 6, Ohio.

Mgh-T-Safe Mfg. Co., Culver City, Calif.

Mosler Safe Co., The, Hamilton, Ohio.

Protectall Safe Corp., Hamilton, Ohio.

Remington Rand, Inc., Tonawanda, N. Y.

Schwab Safe Co., The, Lafayette, Ind.

Star Safe Mfg. Co., Div. of Starco Inc., Compton 3, Calif.

Yale & Towne Mfg. Co., The, White Plains, N. Y.

FOR LIGHT VAULT DOORS (362 E22)

The device shall operate and securely relock the vault door or boltwork if the combination is punched or blown, or if the master connection to the combination box is destroyed by oxy-fuel gas cutting torch or by mechanical force.

Interior unlocking mechanisms installed at the factory in conjunction with labeled relocking devices are examined to determine that they do not detract from the protection

Burglary—Label Service

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Relocking Devices—For Light Vault Doors—*Continued*

Anakin-Pro-Tex Div. of The Lake Erie Chemical Co., Cleveland 14, Ohio.

Diebold, Incorporated, Canton 2, Ohio.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Mosler Safe Co., The, Hamilton, Ohio.

Schwab Safe Co., The, Lafayette, Ind.

FOR HEAVY VAULT DOORS (362 E22)

The devices, which are installed as standard equipment on heavy vault doors having an offset spindle construction or the equivalent protection against punching or blowing the combination lock, shall operate and securely relock the boltwork before an opening of sufficient size is made through the door by means of an oxy-acetylene torch or by torch and drills, to release the original lock connection.

Burglary—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Mosler Safe Co., The, Hamilton, Ohio.

SAFES AND CHESTS (381 A0)

LOOK FOR THE LABEL

KEY-LOCKED—CLASS KL (381 A3)

Burglary Classification KL signifies a key-locked safe designed to offer a limited amount of resistance to all commonly known methods of burglarious attack excepting by means of oxy-fuel gas torches or explosives. Such safes are intended primarily for the protection of daily cash deposits.

Safes which have been examined also as to protection afforded against robbery or holdup are listed as Burglary and Robbery. For maximum protection against robbery the safes should be supplemented by a suitable collection service.

These safes are either anchored in a concrete block when shipped from the factory or have provision for anchoring on the premises in which they are to be used. The manufacturer's instructions for mounting should be carefully followed to secure the proper measure of protection against theft of the entire safe.

Class KL safes are listed under the Label Service of Underwriters' Laboratories, Inc. Each listed device of this class bears a label as illustrated.

The Class KL label is attached to the safe proper and should not be construed as applying to other safes, doors, or containers which may be anchored into the same supporting block.

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service program.

Inspections at factories includes countercheck of design, construction, materials, and assembly. Particular attention is given to thickness and quality of steel, hardened surfaces, strength of locking mechanisms, protection surrounding deposit slots, and to the provision supplied for anchoring the safe.

Burglary and Robbery—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Safes consisting of a cylindrical, case-hardened steel casting mounted in a steel-encased concrete block; a door consisting of a malleable-iron casting with a case-hardened steel cover plate; and a two-key operated lock mechanism.

Mosler Safe Co., The, Hamilton, Ohio.

Safes consisting of a cylindrical, case-hardened steel casting mounted in a steel-encased concrete block; a door consisting of case-hardened steel plates and a two-key operated lock mechanism.

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Safes and Chests—*Continued*

NIGHT DEPOSITORY (381 A4)

A night depository consists of a chest connected by a chute to a head designed to receive deposits after banking hours from outside the bank building.

The head incorporates a high degree of theft resistance to reduce the hazard of removing the deposits through the opening using lines, wires, hooks, small prys, wrenches, and screwdrivers in a relatively quiet attack.

The chute is required to be of welded steel at least 1 in. thick or ¼ in. thick encased in 6 in. of concrete.

The chest is required to have cast- or welded-steel walls at least 1 in. thick and a round door 1½ in. thick with a listed combination lock.

Night depositories are listed under Label Service of "Underwriters' Laboratories, Inc. Each listed device bears a label reading "Underwriters' Laboratories, Inc. Inspected Night Depository Assembly Serial No.....".

The label is attached to the depository head.

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspections at the factory include countercheck of design, construction, materials, and assembly. Particular attention is given to the thickness of materials, deposit openings and theft protection features of the head.

Burglary—Label Service

Diebold, Incorporated, Canton 2, Ohio.

A chest, chute, and a head of a special design to receive either deposit bags or envelopes or both, and to afford a high degree of resistance to theft of the deposits.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

A chest, chute, and a head of a special design to receive deposit bags and to afford a high degree of resistance to theft of deposits.

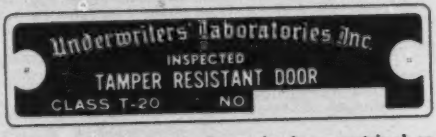
Mosler Safe Co., Hamilton, Ohio.

A chest, chute, and a head of a special design to receive either deposit bags or envelopes or both, and to afford a high degree of resistance to theft of the deposits.

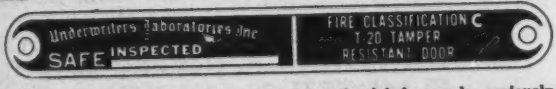
TAMPER-RESISTANT—CLASS T-20 (381 A6)

Tamper resistant door, Class T-20, signifies a safe door which affords a degree of protection against burglarious attacks in which explosives or oxy-fuel gas cutting torches are not employed. Doors classified and labeled as tamper resistant are required to furnish but a limited time resistance to attack and such containers are not recommended for safekeeping of securities or articles of any great monetary value.

Class T-20 doors are listed under the Label Service of Underwriters' Laboratories, Inc. Each listed door device of this class bears a label as illustrated.



Many safes with tamper resistant doors have also been examined as to fire retardant properties. Such safes bear a label with the A or B fire classification, not illustrated or Class C fire (as illustrated) in addition to the Class T-20 tamper resistant door classification.



The fire resistance classification as indicated by the label may be seriously impaired by disturbance or injury of the insulating material in a safe due to fire, burglary, or improper application of accessories.

Repairs to insulation should be made at the factory of the original manufacturer.

The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service program.

Inspections at factories include countercheck of design, construction, materials, and assembly. Particular attention is given to drill-resisting plates and locking bolts.

Burglary—Label Service

Art Metal Construction Co., Jamestown, N. Y.

Diebold, Incorporated, Canton 2, Ohio.

Mosler Safe Corp., Los Angeles 21, Calif.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

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Safes and Chests—Tamper-Resistant—Class T-20—*Continued*

LeFebure Corp., Cedar Rapids, Iowa.

Meilink Steel Safe Co., Toledo 6, Ohio.

Mosler Safe Co., The, Hamilton, Ohio.

Protectall Safe Corp., Hamilton, Ohio.

Safe-Cabinet Div. of Remington Rand, Div. of Sperry Rand Corp., Marietta, Ohio.

Schwab Safe Co., The, Lafayette, Ind.

TOOL-RESISTANT SAFE, CLASS TL-30 (381 A6A)

Burglary Classification TL-30 signifies a combination locked steel chest or safe, designed to offer a moderate degree of protection against expert burglary by common mechanical tools.

Safes shall weigh at least 750 pounds or shall be equipped with suitable anchors and instructions for anchoring in larger safes, in concrete blocks, or to the premises in which located. When practicable, the safe shall be encased at the factory and shipped as a complete unit.

All safes of this class are equipped with a relocking device. They are constructed of open-hearth steel, either cast or welded plates, combined with special materials to resist carbide drills and abrasive cutting tools. The door lugs are of substantial design and the door machined or ground to fit.

Class TL-30 safes are listed under the Label Service of Underwriters' Laboratories, Inc. A label as illustrated, is attached to each safe.

The TL-30 label applies only to the chest or safe to which it is directly attached. The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service Program.

Inspection at the factory includes countercheck of design, construction, materials, and assembly. Particular attention is given to thickness and quality of steel, drill resistant material, locking mechanism, relocking device, door joint clearance, and weight.

Burglary—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Round door and front of drill-resistant metal and open-hearth steel, with welded steel body construction. Equipped with a Group II or Group I combination lock and relocking device. Safes are encased in reinforced concrete block or anchored in another container.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Canton 2, Ohio.

Round door and front of drill-resistant metal and open-hearth steel, with welded steel body construction. Equipped with a Group II or Group I combination lock and relocking device. Safes are encased in reinforced concrete block or anchored in another container.

Mosler Safe Co., Hamilton, Ohio.

Round door of open-hearth steel and drill-resistant metal, with welded steel body construction. Equipped with a Group II or Group I combination lock and relocking device. Safes are encased in a reinforced concrete block, in another container or anchored to the premises.

TORCH- AND TOOL-RESISTANT SAFE, CLASS TRTL-30 (381 A8)

Burglary Classification TRTL-30 signifies a combination locked chest or safe designed to offer a moderate degree of protection against expert burglary by common mechanical tools and cutting torches.

The safe shall be encased in not less than 3 in. of reinforced concrete or in a larger safe or other container. The safe, as encased, shall weigh at least 750 pounds. If the concrete encasement is accomplished away from the factory, it should be supervised by an authorized representative of the manufacturer.

All safes of this class are equipped with a relocking device. They are constructed of open-hearth steel, either cast or welded plates, combined with special materials to resist torches, carbide drills, and abrasive cutting tools. The door lugs are of substantial design and the door machined or ground to fit.

Class TRTL-30 safes are listed under the Label Service of Underwriters' Laboratories, Inc. A label as illustrated, is attached to each safe.

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Safes and Chests—Torch- and Tool-Resistant Safe, Class TRTL-30—*Continued*

The TRTL-30 label applies only to the chest or safe to which it is directly attached. The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service Program.

Inspection at the factory includes countercheck of design, construction, materials, and assembly. Particular attention is given to thickness and quality of steel, drill and torch-resistant material, locking mechanism, relocking device, door joint clearance, and concrete enclosure.

Burglary—Label Service

Diebold, Incorporated, Canton 2, Ohio.

Round door and front of copper, drill resistant metal, and open-hearth steel, with welded steel body construction. Equipped with a labeled Group I combination lock and relocking device. Safes are encased in reinforced concrete block or anchored in another container.

Mosler Safe Co., Hamilton, Ohio.

Round door and front of copper, drill-resistant metal, and open-hearth steel, with welded-steel body construction. Equipped with a labeled Group I combination lock and relocking device. Safes are encased in reinforced concrete block or anchored in another container.

TORCH- AND TOOL-RESISTANT SAFE, CLASS TRTL-60 (381 A12)

Burglary Classification TRTL-60 signifies a combination locked steel chest or safe designed to offer a high degree of protection against expert burglary by common mechanical tools and cutting torches.

Safes depending on concrete to afford the necessary protection against entry shall be encased securely in a concrete block, larger safe, or other container at the factory. The safe, as encased, shall weigh at least 750 pounds.

All safes of this class are equipped with a relocking device. They are constructed of open-hearth steel, either cast or welded plates, combined with special materials to resist torches, carbide drills, and abrasive cutting tools. Door lugs are of substantial design and the door is machined or ground to fit.

Class TRTL-60 safes are listed under the Label Service of Underwriters' Laboratories, Inc. A label as illustrated, is attached to each safe.

The TRTL-60 label applies only to the chest of safe to which it is directly attached. The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service Program.

Inspection at the factory includes countercheck of design, construction, materials, and assembly. Particular attention is given to thickness and quality of steel, torch and tool-resistant materials, locking mechanism, relocking device, door joint clearance, and weight.

Burglary—Label Service

Mosler Safe Co., The, Hamilton, Ohio.

Round-door and front of copper, drill-resistant metal, and open-hearth steel, with welded-steel body construction. Equipped with combination lock and relocking device. Safes encased in reinforced concrete block or anchored in another container.

TORCH-, EXPLOSIVE-, AND TOOL-RESISTANT SAFE, CLASS TXTL-60 (381 A21)

Burglary Classification TXTL-60 signifies a combination locked steel chest or safe designed to offer a high degree of protection against expert burglary by common mechanical tools, cutting torches, high explosives, and any combination of these means within practical limits.

Safes depending on concrete to afford the necessary protection against entry shall be encased securely in a concrete block, larger safe, or other container at the factory. The safe, as encased, shall weigh at least 1,000 pounds.

All safes of this class are equipped with a relocking device. They are constructed of cast open-hearth steel combined with special materials to resist torches, carbide drills, and abrasive cutting tools. It is required that the thickness and strength of material in the door, door lugs, and body, and the clearance beween the door and jamb shall be such as to resist entry with mechanical tools, torches, and high explosives. The door lugs are of substantial design and the door is ground to fit.

Class TXTL-60 safes are listed under the Label Service of Underwriters' Laboratories, Inc. A label as illustrated, is attached to each safe.

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Safes and Chests—Torch-, Explosive-, and Tool-Resistant Safe, Class TXTL-60—*Continued*

The Class TXTL-60 label applies only to the chest or safe to which it is directly attached. The label of Underwriters' Laboratories, Inc. attached to this product is the only method provided by Underwriters' Laboratories, Inc. to identify devices and materials which have been produced under its Factory Inspection and Label Service Program.

Inspection at the factory includes countercheck of design, construction, materials, and assembly. Particular attention is given to thickness and quality of steel, torch and tool-resistant materials, locking mechanism, relocking device, door joint clearance, and weight.

Burglary—Label Service

Brink's Inc., Chicago 16, Ill.

Round door chest of copper, drill-resistant metal, and open-hearth steel, with torch-resisting metal built in the door and body. Equipped with combination lock and relocking device on outer door, and with two-key lock, lug-type inner door. Safe encased in specially reinforced concrete and steel.

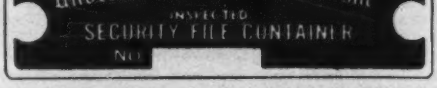
SECURITY FILE CONTAINERS (385 E0)

LOOK FOR THE LABEL

Security file containers are intended to deny surreptitious entry and theft or compromise of documents by highly skilled operators for extended periods without evidence of such activity. These file containers are for the storage of classified matter or documents, important to national security or to public welfare.

While fire protection is not a requirement, some security file containers may be examined also for fire-retardant properties and be so classified. For complete information on such file containers, see the Laboratories' Fire Protection Equipment List.

Security file containers are listed under Label Service of Underwriters' Laboratories, Inc. Each listed device bears a label incorporating the inspection manifest as illustrated:



The label is attached to the exterior of each container, so as to be readily visible.

The label of Underwriters' Laboratories, Inc. attached to the container is the only evidence that such product has been produced under the Factory Inspection and Label Service Program.

Inspection at the factory includes countercheck of design, construction, materials, and assembly.

Particular attention is given to the combination lock, locking bolts, and any special construction features intended to protect against surreptitious entry.

Theft—Label Service

Diebold, Incorporated, Canton 2, Ohio.

TELLERS' LOCKERS (400 E0)

Robbery—Reexamination Service

Diebold, Incorporated, Canton 2, Ohio.

"Cashgard," Types 705, 708, 135-22. Teller's lockers consisting of welded sheet-steel construction separated into upper and lower compartments. Upper section contains sliding steel drawer, one section of which has a hinged bottom which opens when drawer is in closed position. Lower compartment fitted with steel door provided with three bolts controlled by labeled delayed-action timelock.

Intended for use in banks and the like for protection of excess funds during business hours.

Marking: Listee's name and word "Cashgard" and type designation on metal name plate attached to locker.

Mosler Safe Co., Hamilton, Ohio.

Model 30 counter cash protector. Teller's locker consists of a welded sheet-steel construction having an upper cash drawer with a slot for depositing excess funds into a lower reserve compartment fitted with a steel door provided with two bolts controlled by labeled delayed-action timelock.

Intended for use in banks and the like for protection of excess funds during business hours.

Marking: Listee's name and model number on metal name plate attached to the locker.

York Safe & Lock, Canton, Ohio.

"Cashgard," Types 705, 708, 135-22. Teller's lockers consisting of welded sheet-steel construction separated into upper and lower compartments. Upper section contains sliding steel drawer, one section of which has a hinged bottom which opens when drawer is in closed position. Lower compartment fitted with steel door provided with three bolts controlled by labeled delayed-action time-lock.

Intended for use in banks and the like for protection of excess funds during business hours.

Marking: Listee's name and word "Cashgard" and type designation on metal name plate attached to locker.

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VAULT VENTILATORS (EMERGENCY) (440 A0)

LOOK FOR THE LABEL

An emergency vault ventilator is a device intended for installation in a vault wall to provide means for introducing fresh air to persons locked in the vault by accident or during a robbery.

Emergency vault ventilators are examined primarily for safety of integral electrical equipment and strength to resist burglary. When installed in a concrete wall according to the manufacturer's instructions, these ventilator assemblies do not reduce the burglary resistance of the vault wall significantly.

Ventilators should be installed in accordance with the provisions of the National Electrical Code. Also, the conduit for electrical connections should not form a direct path through the wall but should be offset at least once, and preferably twice, so as not to invalidate the burglary classification of the vault. Inspection authorities having jurisdiction should be consulted before installation.

Emergency vault ventilators are listed under Label Service of "Underwriters' Laboratories, Inc." Each listed device bears a label reading "Underwriters' Laboratories, Inc. Inspected Emergency Vault Ventilator Serial No.....".

The label is attached to the ventilator casting or main mounting plate.

The label of Underwriters' Laboratories, Inc. attached to a product is evidence that such product has been produced under the Factory Inspection and Label Service Program. Inspections at the factory include countercheck of design, construction, materials, and assembly.

Burglary—Label Service

Controlled Companies of American District Telegraph Co., New York 13, N. Y.

Diebold Incorporated, Canton 2, Ohio.

Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc., Hamilton, Ohio.

Yale & Towne Mfg. Co., The, White Plains, N. Y.

VEHICLE ALARMS (440 E0)

VEHICLE ALARM UNITS (440 E21)

Listed vehicle alarm units are examined to determine that they are capable of being installed and maintained in accordance with the Laboratories' requirements for the classification and types of vehicles indicated in individual listings. However, neither the character of installation nor maintenance service furnished by the manufacturer, his authorized agents, or installers is supervised by Underwriters' Laboratories, Inc.

Vehicle alarm units are listed under the Reexamination Service of Underwriters' Laboratories, Inc.

Reexamination Service

Auto-Matic Alarm Systems, Chicago 16, Ill.

Model SLT-1. Designed for cargo vehicles of the van and tractor-trailer types. Manual operation with independent-power supply. Has parking device under separate key control. For use in Group II, Vehicle Alarm Systems.

Model CS-1. Designed for van and panel trucks. Semiautomatic operation with vehicle battery-power supply. Has combination and key controls and automatic ignition cut off. For use in Group IV, Vehicle Alarm Systems.

Models LC-9 and LC-9X. Designed for passenger car, panel trucks, and station wagons. Manual operation with vehicle battery-power supply. Has manual key control. Automatic ignition cut off. For use in Group IV, Vehicle Alarm Systems.

Marking: Listee's name and model designation on control unit or siren housing.

Babaco Alarm Systems, Inc., New York 14, N. Y.

Models A3006 and M3006. Designed for trucks, station wagons, and passenger cars. Manual operation with vehicle battery-power supply. Has manual key control. Automatic ignition cut off. For use in Group IV, Vehicle Alarm Systems.

Marking: Listee's name, address, and model designation on control unit or siren housing.

Ever-Ready Automatic Burglar Alarm Co., Inc., New York 11, N. Y.

Ever-Guard Type S-B. Designed for cargo vehicles of the van and tractor-trailer types. Manual operation with independent power supply. Has parking device under separate key control. For use in Group II, Vehicle Alarm Systems.

Marking: Listee's name and type designation on the alarm housing.

Lincoln Safety Co., Hillside Burglar Alarm Div., Eastchester, N. Y.

Model MC-ST. Designed for cargo vehicles of the tractor-trailer type. Manual operation with independent power supply. Has parking device under separate key control. For use in Group II, Vehicle Alarm Systems.

Model MC-4. Designed for trucks, passenger cars, and station wagons. Manual operation with vehicle battery-power supply. Has manual key control automatic ignition cut off. For use in Group IV, Vehicle Alarm Systems.

Marking: Listee's name and model designation.

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Vehicle Alarms—Vehicle Alarm Units—*Continued*

Victor Truck & Car Alarm Systems, Inc., Clifton, N. J.

Model MC-2T. Designed for cargo vehicles of the tractor-trailer type. Manual operation with independent power supply. Has parking device under separate key control. For use in Group II, Vehicle Alarm Systems.
Model MC-4. Designed for trucks, passenger cars, and station wagons. Manual operation with vehicle battery-power supply. Has manual key control. Automatic ignition cut off. For use in Group IV, Vehicle Alarm Systems.
Marking: Listee's name and model designation.

LIST OF MARKINGS

The following is a list of markings used for identifying devices listed under Reexamination Service where the accepted marking does not include the listee's name.

Having determined the listee's name, reference should be made to the group under which the device is classified to determine if the product is listed.

No markings appearing on the devices listed under the Label Service are included here since the label is evidence of compliance with the requirements of Underwriters' Laboratories, Inc.

"ADT"—Controlled Companies of American District Telegraph Co.
"APC"—Alarm Products, Inc.
"Ace"—
Chicago Lock Co.
Fruh & Co., A. W.
"Alarm Device Mfg. Co., Brooklyn, N. Y." or "Alarm Co., Inc., Brooklyn 6, N. Y." —Ademco, Inc.
"Cerberus Swiss Made"—Central Station Signals, Inc.
"DAC"—Bay Alarm Co.
"DECO"—Mosler Safe Co.
"E"—Electro-Protective Corp.
"EPC"—Electro-Protective Corp.
"G" in a circle—Guardian Alarm Supply Co.
"HHMCO"—Herring-Hall-Marvin Safe Co., Div. of Diebold, Inc.
"IPC" stamped in circle—Imperial Products Co., Inc.
"LOF" in a shield and "Bullet-Resisting Plate," together with type designation sandblasted in glass near one corner—Libbey-Owens-Ford Glass Co.
"MGC high test" in an oval and "Bullet Resistant" together with type designation sandblasted in glass near one corner —Multiplate Glass Corp.
"Multiplate"—Pittsburgh Plate Glass Co.
"P" in a circle—Potter Electric Signal Co.
"Three small triangles, underneath which will appear the type letters and the name 'Armorlite' " — American Saint-Gobain Corp.

The label or listed marking on a product is evidence that such product has been produced under the Follow-Up Program of Underwriters' Laboratories, Inc. Such marking does not mean that products of the same classification are necessarily equivalent in quality

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LIST OF MARKINGS

ACCIDENT EQUIPMENT—See PAGE 62

INDEX

Accident Equipment List

Page

Acetylene Appliances (See Gas Appliances) 48

Belt Fasteners and Lacers 9
Belts and Fittings (Window Cleaners') 9
Blowpipes and Torches (See Gas Appliances) 48
Blowpipes—Metal-Spraying 49

Clamps, Wire Rope 61
Cleaning Liquids (See Gas and Oil Equipment List)
Contacts and Locking Devices, Elevator Door 10
Cookers, Pressure 9
Couplers, Hose 50
Couplings, Medical Gas Hose 56
Cylinders, Trucks for High Pressure.... 50

Devices (Scaffolding) 57
Dispensers, Flux 49
Dispensers for Powder Blowpipes 10

Earthquake Valves, Gas Shut-Off 50
Electric Motors for Use in Hazardous Locations (See Hazardous Location Equipment List)
Elevator Appliances 10
Elevator Door Locking Devices and Contacts 10
Miscellaneous 12
Equipment (Scaffolding) 58
Exit and Exit Appliances 13
Exit Locks 13
Fire Escape Units 13
Panic Hardware 13

Fire Escape Units 13
Fittings, Refrigeration (See Electrical Appliance and Utilization Equipment List)
Flashlights and Lanterns (See Hazardous Location Equipment List)
Floor Coating and Finishing Material.... 14
Floor Wax 14
Flux Dispensers 49

Gardening Appliances (See Electrical Appliance and Utilization Equipment List)
Gas Appliances 48
Blowpipes 48
Blowpipes—Metal-Spraying 49
Flux Dispensers 49
Gauges for Compressed Gas 49
Hose Couplers 50
Station Terminal, Oxygen 50
Torches 48
Trucks for High-Pressure Cylinders.... 50
Valves—Earthquake, Gas Shut-Off 50
Valves, Reducing 51
Valves—Shut-Off, Oxy-Acetylene 54
Gas-Pressure Regulators 57
Gas Shut-Off Earthquake Valves 50
Gauges for Compressed Gas 49
Gloves, Safety 61

Hardware, Panic 13
Hose Couplers 50

Lacers, Belt Fasteners and 9
Ladders and Ladder Accessories 54
Accessories 54
Ladders 55

Page

Lanterns and Flashlights (See Hazardous Location Equipment List)
Latch Release and Panic Bar (See Panic Hardware) 13
Leather-Edging Machine 56
Locking Devices and Contacts, Elevator Door 10
Locks, Exit 13

Machine, Leather-Edging 56
Medical Gas Hose Couplings 56
Medical Gas Station Outlets 60
Metal-Spraying Blowpipes 49
Motors for Use in Hazardous Locations, Electric (See Hazardous Location Equipment List)

Oil Tank, Winch 61
Oxy-Acetylene Shut-Off Valves 54
Oxygen Station Terminal 50

Panic Bar and Latch Release (See Panic Hardware) 13
Panic Hardware 13
Powder Actuated Tools 60
Powder Blowpipes, Dispensers for 10
Pressure Cookers 9

Reducing Valves 51
Refrigerating Machines (See Electrical Appliance and Utilization Equipment List)
Refrigeration Appliances (See Electrical Appliance and Utilization Equipment List)
Regulators, Gas-Pressure 57
Relays 57
Relief Valves, Transformer 57

Safety Gloves 61
Scaffolding 57
Devices 57
Equipment 58
Shut-Off Valves, Oxy-Acetylene 54
Slide Type Fire Escapes 13
Spiral Slide Fire Escapes 13
Station Outlets for Medical Gas 60
Station Terminal, Oxygen 50
Step Ladders 55
Switches (See Elevator Appliances, Miscellaneous) 12

Terminal, Oxygen Station 50
Tools, Powder Actuated 60
Torches 48
Transformer Relief Valves 57
Trucks for High-Pressure Cylinders 50

Units, Fire Escape 13

Valves, Earthquake, Gas Shut-Off 50
Valves, Electric Refrigerant (See Gas and Oil Equipment List)
Valves, Reducing 51
Valves—Shut-Off Oxy-Acetylene 54
Valves, Transformer Relief 57

Washing Machine Wringers 61
Wax, Floor 14
Wearing Apparel 61
Safety Gloves 61
Winch, Oil Tank 61
Window Cleaners' Belts and Fittings.... 9
Wire Rope Clamps 61
Wringers, Washing Machine 61

ED CLOSE TO EDGE

[fol. 1568]

LIST OF MARKINGS

AUTOMOTIVE EQUIPMENT—See PAGE 50

INDEX

Automotive Equipment List

	Page
Air Cleaners (See Deflectors, Backfire)	64
Automobile Fuses	66
Automobile Heaters	86
Automobile Mufflers	70
Automotive Fuel Tanks	73
Automotive Type LP-Gas Accessories	67
Automotive Vehicles, LP-Gas Fueled	70
Backfire Deflectors	64
Battery-Powered Industrial Trucks, Electric	74
Cleaning Machines—Internal Combustion Engine-Powered	63
Type G	63
Type LP	64
Conversion System, LP-Gas	64
Deflectors, Backfire	64
Electric Flares	71
Electric Lanterns	71
Electric Battery-Powered Industrial Trucks	74
Engine-Powered Industrial Trucks, Internal Combustion	76
Fill and Vent Fittings	65
Flares, Electric	71
Flares, Kerosene	71
Fuel Tanks, Automotive	73
Fuel Feed Systems	65
Fuses	71
Fuses, Automobile	66
Gasoline (Electric) Gauges	66
Gauges, Gasoline (Electric)	66
Heaters	66
Combustion	66
Highway Emergency Signals	71
Industrial Trucks	74
Internal Combustion Engine-Powered Cleaning Machines	63
Internal Combustion Engine-Powered Industrial Trucks	76
Kerosene Flares	71
LP-Gas Accessories, Automotive Type	67
LP-Gas Conversion System	64
LP-Gas Fueled Automotive Vehicles	70
Lanterns, Electric	71
Machines, Cleaning—Internal Combustion Engine-Powered	63
Mufflers for Automobiles	70
Signal, Highway Emergency	71
Signals and Signaling Appliances	71
Highway Emergency Signal	71
Switches	72
Tanks, Automotive Fuel	73
Trucks, Industrial	74
Electric, Battery-Powered	74
Type E	74
Type EE	75
Internal Combustion Engine-Powered	76
Type D	76
Type DS	76
Type G	77
Type GS	78
Type LP	78
Type LPS	79
Tubing	79
Vehicles, LP-Gas Fueled Automotive	70
Vent and Fill Fittings	65

COPY PRINTED

LIST OF MARKINGS

BURGLARY PROTECTION EQUIPMENT—See PAGE 127

INDEX

Burglary Protection Equipment List

Page

Alarm System Units 82
Central Station Alarm Units 82
Contacts and Switches 82
Electronic Units 84
Floor Traps 84
Holdup Alarm Units 85
Linings and Screens 85
Local Alarm Units 86
Power Supplies 86
Relays 87
Sounding Devices 87
Alarm Units for Vehicles 126

Bag, Messenger 119
Bank Safe and Vault Alarm Systems (Central Station) 92
Bank Safe and Vault Alarm Systems (Combination Central Station and Local) 99
Bank Safe and Vault Alarm Systems (Local) 102
Bullet-Resisting Enclosures 87
Bullet-Resisting Enclosures and Alarm Systems 89
Bullet-Resisting Materials 89
Bullet-Resisting Glass 89
Tellers' Fixtures 90
Burglar Alarm Systems 91
Central Station 91
Bank Safe and Vault Alarm 92
Mercantile Premises Alarm 94
Mercantile Safe and Vault Alarm 97
Combination Central Station and Local 99
Bank Safe and Vault Alarm 99
Mercantile Premises Alarm 99
Mercantile Safe and Vault Alarm 101
Local 101
Bank Safe and Vault Alarm 102
Mercantile Premises Alarm 102
Mercantile Safe and Vault Alarm 111

Central Station Alarm Units 82
Chemical and Gas Systems 112
Chests, Safes and 121
Combination Locks 115
Connector, Flexible (See Contacts and Switches) 82
Contacts and Switches 82
Containers, Security File 125
Cylinders, Locking 117

Delayed Action Timelocks 118

Electronic Units 84
Emergency Vault Ventilators 126

Flexible Connector (See Contacts and Switches) 82
Floor Traps 84

Gas and Chemical Systems 112
For Interior Robbery 113
For Safes 113
For Vaults 113
Glass, Bullet-Resisting 89

Holdup Alarm Systems 113
Manual Alarms 114
Semiautomatic Alarms 115
Holdup Alarm Units 85

Page

Insulating Materials (See Electrical Construction Materials List)

Linings and Screens 85
Local Alarm Units 86
Lockers, Tellers' 126
Locks 115
Combination Locks 115
Locking Cylinders 117
Locks for Safe Deposit Boxes 117
Timelocks 118
Locking Cylinders 117
Lock Switches 82

Mercantile Premises Alarm Systems (Central Station) 94
Mercantile Premises Alarm Systems (Combination Central Station and Local) 99
Mercantile Premises Alarm Systems (Local) 102
Mercantile Safe and Vault Alarm Systems (Central Station) 97
Mercantile Safe and Vault Alarm Systems (Combination Central Station and Local) 101
Mercantile Safe and Vault Alarm Systems (Local) 111
Messenger Bag 119
Meters, Parking 119

Parking Meters 119
Power Supplies 86

Relays 87
Relocking Devices 119
For Safes or Chests 120
For Light Vault Doors 120
For Heavy Vault Doors 121

Safes and Chests 121
Key-Locked—Class KL 121
Night Depository 122
Tamper-Resistant—Class T-20 122
Tool-Resistant—Class TL-30 123
Torch- and Tool-Resistant, Class TRTL-30 123
Torch- and Tool-Resistant, Class TRTL-60 124
Torch-, Explosive-, and Tool-Resistant, Class TXTL-60 124
Safe Deposit Locks 117
Screens and Linings 85
Security File Containers 125
Sounding Devices 87
Springs, Contact (See Contacts and Switches) 82
Switches—Alarm System Unit 82
Switches, Lock 82

Tellers' Fixtures 90
Tellers' Lockers 125
Timelocks 118

Vault Ventilators (Emergency) 126
Vehicle Alarms 126
Vehicle Alarm Units 126

Watchman's Time Recorders (See Fire Protection Equipment List)

TED CLOSE TO EDGE

[fol. 1570]

PUBLISHED STANDARDS OF UNDERWRITERS' LABORATORIES, INC.

Obtainable from the Chicago, New York, and Santa Clara Offices

The numbers just preceding the dates of issue are the Laboratories' subject numbers for the classifications.

BURGLARY PROTECTION DEPARTMENT
(Restricted Distribution)

Bullet-Resisting Equipment	752	July 1956
Burglar-Alarm Systems, Central Station	611	Dec. 1956
Burglar-Alarm Systems, Installation, Classification, and Certification of	681	Feb. 1959
Burglar-Alarm Systems, Local	609, 610	Oct. 1956
Burglary-Resistant Safes	687	June 1960
Combination Locks	768	May 1961
Holdup-Alarm Systems	636	Feb. 1956
Key-Locked Safes	786	May 1956
Key Locks	437	Dec. 1957
Night Depositories	771	July 1955
Relocking Devices	140	Jan. 1959
Security File Containers	505	Nov. 1956
Tamper-Resistant Doors	720	May 1955
Tear-Gas Systems	600	Jan. 1945
Tellers' Lockers	901	July 1953
Timelocks, Delayed Action (Burglary and Robbery)	887	Jan. 1945
Vault Ventilators, Emergency	680	June 1959
Vehicle-Alarm Systems	904	Nov. 1950

CASUALTY AND AUTOMOTIVE DEPARTMENT

Air Conditioners, Central Cooling	465	Dec. 1957
Air Conditioners, Room	484	Sept. 1957
Automotive Glass-Tube Fuses	275(b)	Dec. 1957
Condensing Units, Refrigeration	303	Nov. 1959
Cookers, Pressure	136	Mar. 1948
Dehumidifiers	474	Aug. 1957
Elevator Door Locking Devices and Contacts	104	Jan. 1961
Fittings, Automotive, Gas, Hazardous Liquids, and Refrigeration	109	Sept. 1940
Gauges, High-Pressure Gas	404	June 1953
Heat Pumps	559	Aug. 1959
Ice Cream Freezers and Soda Fountain Units	621	Jan. 1961
Ice Makers	563	Oct. 1958
Ladders, Portable Metal	184	July 1958
Ladders, Portable Wood	112	Dec. 1959
Lamps, Clearance, Marker, and Identification, for Motor Vehicles	275(c)	July 1950
Oxygen Therapy Equipment, Refrigerated	416	Aug. 1956
Panic Hardware	305	Nov. 1955
Pressure Regulators, Gas	252	Aug. 1960
Refrigerant-Containing Components	207(c)	Jan. 1954
Refrigerators, Commercial	471	Oct. 1957
Refrigerators and Freezers, Household	250	Aug. 1958
Signal Systems for Automotive Vehicles, Direction	919	July 1950
Signals, Highway Emergency	912	Sept. 1940
Tanks, Automotive Fuel	395	Nov. 1958
Torches, Oxy-Fuel Gas	123	Aug. 1960
Trucks, LP-Gas Industrial	558	Sept. 1958
Trucks, Power-Operated Industrial	583	Nov. 1956
Vending Machines, Coin-Operated, Refrigerated	541	Aug. 1958
Water Coolers, Drinking	399	Dec. 1954

CHEMICAL DEPARTMENT

Fittings, Electrical, for Use in Hazardous Locations, Class I, Group D	886	Mar. 1950
Fixtures, Electric Lighting, for Use in Hazardous Locations	844	Mar. 1950
Flame Arresters for Use in Open Vent Pipes of Oil-Storage Tanks	525	July 1[illegible]
Hose, Chemical-Engine	93	M[illegible]
Hose, Cotton Rubber-Lined Fire, for Public and Private Department Use	[illegible]	

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CHEMICAL DEPARTMENT—Continued

Hose for Conducting Gasoline	330	July	1950
Hose for Conducting LP-Gas	21	Sept.	1955
Hose, Unlined Fire	18	Jan.	1957
Industrial Control Equipment for Use in Hazardous Locations	698	Dec.	1949
Motors and Generators, Electric, for Use in Hazardous Locations, Class II, Groups F and G	674(a)	May	1950
Motors and Generators, Electric, for Use in Hazardous Locations, Class I, Groups C and D (Part I—Integral HP)	674(b)	May	1950
Motors and Generators, Electric, for Use in Hazardous Locations, Class I, Groups C and D (Part II—Fractional HP)	674(c)	May	1950
Snap Switches for Use in Hazardous Locations	894	Apr.	1954
Sweeping Compounds	41	Jan.	1953

ELECTRICAL DEPARTMENT

Arc-Welding Machines, Transformer-Type	551	Oct.	1952
Armored Cable	4	Mar.	1959
Attachment Plugs and Receptacles	498	Dec.	1959
Ballasts, Fluorescent-Lamp	935	Sept.	1958
Beauty Parlor Equipment	859	Sept.	1954
Busways and Associated Fittings	857	May	1959
Cabinets and Boxes	50	May	1956
Capacitors	810	Nov.	1953
Christmas-Tree and Decorative-Lighting Outfits	588	Feb.	1961
Circuit-Breakers, Branch-Circuit and Service	489	Dec.	1954
Cleats, Knobs, and Tubes, Porcelain	511	Nov.	1937
Conduit, Fiber	543	Jan.	1954
Conduit, Flexible Steel	1	June	1957
Conduit, Rigid Metallic	6	Dec.	1956
Control Units for Fire-Protective Signaling Systems	864	Sept.	1957
Cooking Appliances, Commercial Electric	197	Oct.	1960
Cord Reels	355	Mar.	1954
Cord Sets and Power-Supply Cords	817	Dec.	1955
Electrical Metallic Tubing	797	Apr.	1942
Electrode Receptacles for Gas Tube Signs	879	Feb.	1940
Emergency Lighting Equipment	924	Dec.	1958
Fans, Electric	507	May	1961
Fence Controllers, Electric	69	June	1948
Fixtures, Electric Lighting	57	Aug.	1959
Fixtures, Electric Lighting, Marine Type	595	June	1958
Flatirons and Ironing Machines, Electric	141	Apr.	1954
Flexible Cord and Fixture Wire	62	Apr.	1961
Frames, Electrically Illuminated	368	Feb.	1957
Fuseholders	512	May	1961
Fuses	198	Apr.	1955
Gas-Tube-Sign and Ignition Cable	814	Oct.	1948
Grounding and Bonding Equipment	467	Apr.	1957
Heating Appliances, Electric	499	Aug.	1956
Home Laundry Equipment	560	May	1961
Industrial Control Equipment	508	May	1956
Lampholders, Edison-Base	496	Nov.	1955
Lampholders, Starters, and Starter Holders for Fluorescent Lamps	542	Sept.	1958
Lamps, Portable Electric	153	Mar.	1958
Lamps, Therapeutic	482	May	1957
Lightning Arresters, Radio and Television	452	Dec.	1953
Meter Sockets	414	Oct.	1957
Motor-Operated Appliances	73	Dec.	1960
Nonmetallic-Sheathed and Underground Feeder Cables	719	Feb.	1957
Outlet Boxes and Fittings	514	Mar.	1951
Pads and Bedding, Electrically Heated	130	Dec.	1954
Panelboards	67	Nov.	1948
Protectors for Communication Circuits	497	Mar.	1953
Protectors for Motors, Thermal	547	Dec.	1958
Raceways and Fittings, Cellular Metal Floor	209	Dec.	1956
Raceways and Fittings, Surface Metal	5	Dec.	1940
Raceways and Fittings, Underfloor	884	Apr.	1956
Radio and Television Receiving Appliances	492	Oct.	1958
Ranges, Domestic Electric	858	Dec.	1956
[illegible]	516	July	1940
[illegible]	351	Oct.	1952

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ELECTRICAL DEPARTMENT—Continued

Scales, Electrically Illuminated	466	Nov. 1950
Service Cables	854	Apr. 1957
Service Equipment	869	Sept. 1951
Signal Appliances, Audible	464	June 1956
Signs, Electric	48	Dec. 1960
Sound-Recording and -Reproducing Equipment	813	Nov. 1954
Space-Heating Equipment, Electric	573	Mar. 1961
Switchboards, Dead-Front	891	June 1957
Switches, Enclosed	98	Apr. 1951
Switches, Knife	363	Feb. 1955
Switches, Snap	20	Aug. 1956
Tape, Insulating	510	Mar. 1954
Temperature-Indicating and -Regulating Equipment	873	Dec. 1958
Time-Indicating and -Recording Appliances	863	Oct. 1941
Tools, Electric	45	Oct. 1960
Toys, Electric	696	Dec. 1953
Transformers, Specialty	506	Oct. 1951
Tubing, Flexible Nonmetallic	3	Sept. 1939
Water Heaters, Electric Storage-Tank	174	June 1956
Wire Connectors and Soldering Lugs	486	Feb. 1953
Wired Cabinets	65	Dec. 1955
Wires and Cables, Rubber-Insulated	44	May 1961
Wires and Cables, Varnished-Cloth	133	Nov. 1939
Wires, Asbestos- and Asbestos-Varnished-Cloth-Insulated	115	Dec. 1960
Wires, Thermoplastic-Insulated	83	Apr. 1948
Wires, Weatherproof and Slowburning	520	May 1957
Wireways, Auxiliary Gutters, and Associated Fittings	870	Oct. 1943
X-Ray Equipment	187	Nov. 1957

FIRE PROTECTION DEPARTMENT

Air-Foam Equipment and Liquid Concentrates	162	May 1960
Building Construction and Materials, Fire Tests of	263	May 1959
Concrete Masonry Units	618	Aug. 1958
Couplings, 2½-In., for Rubber-Lined Fire Hose	236	May 1951
Door Assemblies, Fire Tests of	10(b)	Nov. 1957
Door Frames, Fire	63	Aug. 1961
Doors, Tin-Clad Fire	10(a)	Jan. 1956
Doors, Vault and Fire-Storage-Room, Fire Resistance Classification of	155	Dec. 1941
Extinguishers, Carbon Dioxide Hand Fire	154	Mar. 1956
Extinguishers, Dry-Chemical, Hand Fire	299	Sept. 1959
Extinguishers, Foam, 2½-Gallon	7(b)	July 1950
Extinguishers, Foam, 33-Gallon	68	July 1950
Extinguishers, Soda-Acid, Loose Stopple, 2½-Gallon	7(c)	July 1950
Fabrics, Flame-Resistant, Flame Tests of	214	Aug. 1955
Filter Units, Air, High Efficiency	586	Sept. 1959
Fire Hazard Classification of Building Materials, Test Method for	723	Aug. 1960
Gauges (Section 3), Nonrecording Spring-Pressure	393	Oct. 1921
Hardware, Sliding, for Standard Tin-Clad Fire Doors	14(b)	Nov. 1953
Hardware, Swinging, for Standard Tin-Clad Fire Doors	14(c)	May 1943
Hydrants, Private and Municipal Fire Department Service	246	Jan. 1958
Indicator Posts	262(c)	May 1951
Pipe Hanger Equipment	203	Jan. 1958
Pipe, Steel, for Underground Water Service	888	May 1950
Play Pipes	385	June 1953
Pumping Equipment for Private Fire Service	448	Nov. 1958
Record-Protection Equipment, Fire-resistance Classification of	72	July 1952
Roof-Covering Materials, Rag-Felt, for Build-Up Roof Coverings	55(a)	Nov. 1951
Roof Covering Materials, Test Method for Fire Resistance of	790	Sept. 1958
Roofing and Shingles, Class "C" Asphalt Organic-Felt Sheet	55(b)	Feb. 1960
Sprinklers (Section 3), Automatic	199	Dec. 1919
Unions, Pipe	860	July 1950
Valves, Alarm	193	June 1953
Valves, Dry-Pipe, Deluge, and Pre-Action	260	June 1957
Valves, Gate, Outside-Screw and Yoke	262(b)	Aug. 1950
Valves, Hose—Fire	668	June 1956
Valves, Inside-Screw, for Underground Work	262(a)	Mar. 1961
Valves, Swing Check (Regular Type)	312	Sept. 1951

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GASES AND OILS DEPARTMENT

Acetylene Generators, Portable, Medium-Pressure	297	Dec. 1953
Acetylene Generators, Stationary, Low-Pressure	409	Dec. 1953
Acetylene Generators, Stationary, Medium-Pressure	408	Dec. 1953
Chimneys, Factory-Built	103	Aug. 1959
Container Assemblies for LP-Gas	644	May 1959
Dispensing Devices for Flammable Liquids, Power-Operated	87	July 1958
Draft Equipment	378	July 1957
Fireplaces, Factory-Built	127	Jan. 1960
Gas Heating Equipment, Commercial-Industrial	795	Nov. 1952
Gas Vents	441	Sept. 1958
Gauges and Indicators, Liquid-Level, For Anhydrous Ammonia and LP-Gas	565	Nov. 1958
Gauges and Indicators, Liquid-Level, For Flammable Liquids	180	Nov. 1958
Heaters, Portable Kerosene (Standard Specifications)	647(a)	June 1924
Hose, Flexible Metallic	536	Aug. 1958
Incinerators, Domestic Type	791	June 1956
Manifolds, High-Pressure Gas	407	Dec. 1959
Meters for Flammable Liquids and LP-Gas	25	Apr. 1959
Oil Burners	296	May 1959
Oil Burners for Installation in Stoves and Ranges	865	Apr. 1932
Oil-Fired Air Heaters and Direct-Fired Heaters	783	Aug. 1955
Oil-Fired Boilers	726	June 1955
Oil-Fired Central Furnaces	727	Aug. 1961
Oil-Fired Floor Furnaces	729	May 1955
Oil-Fired Recessed Heaters	730	Aug. 1955
Oil-Fired Unit Heaters	731	Aug. 1955
Oil-Fired Water Heaters	732	July 1955
Oil Heaters, Electric	574	Sept. 1959
Pigtails, Expansion Coils, and Flexible Hose Connectors for LP-Gas	569	Apr. 1959
Pipe Connectors for Flammable Liquids and LP-Gas	567	Aug. 1959
Pressure Regulators for LP-Gas	144	Dec. 1959
Pumps, for Anhydrous Ammonia and LP-Gas	51	Sept. 1959
Pumps, Oil-Burning Appliances	343	July 1957
Pumps, Power-Operated, and Discharge-Device Accessory Pumps	79	June 1938
Roof Jacks for Trailer Coaches	311	July 1958
Safety Cans	30	Feb. 1954
Stoves, Kerosene, for Cooking and Heating	647(b)	Aug. 1927
Stoves, Oil-Burning	896	Mar. 1957
Strainers for Hazardous Fluids	331	Mar. 1957
Tanks, Aboveground Storage, for Hazardous Liquids	142	Oct. 1953
Tanks, Inside for Oil Burner Fuel	80	Feb. 1958
Tanks, Septic, Bituminous-Coated Metal	70	June 1958
Tanks, Underground Storage, for Hazardous Liquids	58	Apr. 1949
Trailer Coaches, Gas- and Oil-Fired Heating Appliances	307	May 1958
Valves, Constant-Level Oil	352	Sept. 1957
Valves, Electrically Operated	429	Jan. 1955
Valves, for Flammable Liquids and Fuel Gases	842	Nov. 1959
Valves for LP-Gas	125	Oct. 1956
Valves, Relief for Anhydrous Ammonia and LP-Gas	132	Dec. 1958
Waste Cans	32	Aug. 1954

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GOVERNMENT EXHIBIT No. 5
BANK

DISCOUNTS (Continued)

10. WATCHMAN DISCOUNT (Burglary)

No discount shall be allowed for more than three watchmen at any one location.

30%—For bank burglary insurance for each private watchman employed exclusively by the assured, who will be on duty within the building in which the premises of the assured are located at all times between the hours beginning at 7 P.M. and ending at 7 A.M., when said premises are not regularly open for business, and who signals at least hourly in the assured's premises to a central station located outside the assured's premises or to a police station provided there is a regular policeman on duty therein at all times.

BANK

15%—For bank burglary insurance for each such watchman who does not signal to an outside station, but who registers at least hourly on a watchman's clock in the assured's premises.

10%—For bank burglary insurance for each such watchman who does not signal to an outside station or register on a watchman's clock.

If such watchman is not on duty at all times between the hours beginning at 7 P.M. and ending 7 A.M., deduct from the above discounts applicable to a similar full time watchman, the following percentages for each hour or fraction thereof which the watchman is not on duty.

4% Central Station
2% Clock
1⅔% Non Registering

Examples:

If a non registering watchman is on duty from 7 P.M. to 5:30 A.M., deduct 2⅔%, leaving a net discount of 7⅓%.

If a central station watchman is on duty from 8 P.M. to 5 A.M., deduct 12%, leaving a net discount of 18%.

One half the regular discount shall be allowed for any such watchman who, not more than once each hour and then only for a short period of time, leaves the building containing the assured's premises during the prescribed hours of duty.

Five sixths the regular discount shall be allowed for any such watchman who registers or signals every two hours.

Two thirds the regular discount shall be allowed for any such watchman who registers or signals every three hours.

If any such watchman registers or signals at intervals greater than three hours, the non registering discount is applicable.

One third the regular discount shall be allowed for any such watchman who is employed by the building owner instead of exclusively by the assured.

BURGLARY MANUAL

Revised to October 29, 1958

DISCOUNTS (Continued)

11. DIVISION OF INSURANCE DISCOUNT (Burglary)

20%—If the total insurance in one or more policies in one or more companies is divided so that not more than 50% of the insurance applying to all safes, chests and vaults at one location applies to any one safe, chest or vault at the same location.

10%—If the total insurance in one or more policies in one or more companies is divided so that not more than 75% of the insurance applying to all safes, chests and vaults at one location applies to any one safe, chest or vault at the same location.

No discount is permissible for any division of insurance between a vault and any safe or chest therein, nor for any division of insurance between a safe and any chest therein.

No discount is permissible for any division of insurance in a safe, chest or vault that has no bearing on the rate. *For example, a burglar-resistive vault contains two fire-resistive safes. If the total insurance of $50,000 is limited to apply $25,000 in each safe, no division of insurance discount is in order because the insurance rate is based on the burglar-resistive vault and not the fire-resistive safes.*

It is not permissible to state in the policy that "not more than 50% (or 75%) of the total insurance applies to any one safe, chest or vault."

12. TEAR GAS SYSTEM DISCOUNT (Burglary)

For bank burglary insurance the following discounts shall be allowed where the safe or vault is equipped with an approved tear gas system listed hereunder provided the assured holds an unexpired Underwriters' Laboratories, Inc. certificate. Use standard endorsement B 206.

20%—Complete system protecting the top, bottom, all sides and outer door(s) of the safe or vault.

10%—Partial system protecting (a) the combination and connections to the combination lock with or without protection on the full surface of the outer door(s) of a safe, or (b) the combination and connections to the combination lock and the full surface of the outer door(s) of a vault.

Approved Tear Gas Systems

Federal Laboratories, Inc., Pittsburgh, Penn.

Lake Erie Chemical Co., Cleveland, Ohio

DISCOUNTS (Continued)

13. SAFE AND VAULT ALARM SYSTEM DISCOUNT (Burglary)

For bank burglary insurance, if the safe or vault is protected with an approved burglar alarm system installed by one of the ★ companies listed on the territorial pages for the state in which the alarm company operates, and the assured holds an unexpired Underwriters' Laboratories, Inc. certificate, the following discounts shall be allowed. The classification on the certificate governs the discount applicable.

BANK

INSTALLATION	Class A	Class B	Class C
Complete System protecting the top, bottom, all sides and outer door(s) of the safe or vault and connected with an outside central station or with a loud sounding gong or siren on the outside of the building....	65%	55%	50%
Partial System protecting the locking or bolt mechanism, or the lining of the outer door(s) (but not attached to lining of safe or vault walls) and connected with an outside central station or with a loud sounding gong or siren on the outside of the building.....	35%	25%	20%

APPROVED BURGLAR ALARM COMPANIES

★ The companies installing approved local gong or siren burglar alarms or central station burglar alarms for protecting safes and vaults are listed on the territorial pages for the state in which the alarm company operates.

Companies installing approved local gong or siren burglar alarms for safes and vaults are designated "BL".

Companies installing central station burglar alarms for safes and vaults are designated "BCS".

The assured must hold an unexpired Underwriters' Laboratories, Inc. certificate because some companies install both approved and unapproved systems.

★

DISCOUNTS (Continued)

14. HOLDUP ALARM AND PROTECTION SYSTEM DISCOUNT (Robbery)

10%—For bank robbery insurance for an approved semi-automatic holdup alarm and protection system listed hereunder provided the assured holds an unexpired Underwriters' Laboratories, Inc. certificate. Use standard endorsement B 207.

Approved Holdup Alarm and Protection Systems

American District Telegraph Co. and Controlled Companies (Controlled Companies are marked with an * on the state territorial pages).

O. B. McClintock Division, Diebold, Inc., Canton, Ohio

15. GUARD DISCOUNT (Robbery)

10%—For bank robbery insurance for each guard (not exceeding three at any one location) with no other duties, who is on duty within the premises, or at the door thereof, at all times when the premises are regularly open for business.

16. BANDIT RESISTING ENCLOSURE DISCOUNT (Robbery)

20%—For bank robbery insurance for an approved bandit resisting enclosure listed hereunder provided the assured holds an unexpired Underwriters' Laboratories, Inc. certificate. Use standard endorsement B 208.

Approved Bandit Resisting Enclosures

Chicago Bank Equipment Co., Chicago, Ill.
Chicago Bullet-Proof Equipment Co., Chicago, Ill.
Lenander Fixture Co., Joliet, Ill.
O. B. McClintock Division, Diebold, Inc., Canton, Ohio
Mosler Safe Co., Hamilton, Ohio

*

[fol. 1578]

8. DIVIDED COVERAGE FOR SPECIAL CLASSIFICATIONS

★ Risks rated under the classifications on pages 305-328 marked with an asterisk (*) or double section mark (§§) may be insured on a divided coverage basis. The merchandise is divided into two or three groups and a separate amount of insurance applies to each: class (a) consisting of the highest rated merchandise, class (b) consisting of the next lower rated merchandise, and class (c) consisting of the lowest rated merchandise.

If insurance is written under class (a) at least an equal amount must be written under classes (b) or (c), or both combined. The coinsurance percentage and coinsurance limit for the merchandise insured under each class are included thereunder, and the coinsurance clause applies separately to each class.

The premium for each class is computed at the rates for the merchandise insured thereunder, applying the initial thousands rates for the highest rated merchandise and the successive thousands rates for the next lower rated, and so on. Use standard endorsement B 311.

DISCOUNTS

9. WATCHMAN DISCOUNT

No discount shall be allowed for more than three watchmen at any one premises.

30%—For each private watchman employed exclusively by the insured, who will be on duty within the premises of the insured at all times when said premises are not regularly open for business, and who will make at least hourly rounds and signal at least hourly in the insured's premises to a central station located outside the insured's plant or to a police station, provided there is at least one regular policeman on duty thereat all times.

15%—For each such watchman who does not signal to an outside station, but who registers at least hourly on a watchman's clock in the insured's premises.

10%—For each such watchman who does not signal to an outside station or register on a watchman's clock.

One half the regular discount shall be allowed for any such watchman who is not on duty during the daytime of Saturday or one other weekday when the premises are not open for business.

[fol. 1579]

DISCOUNTS (Continued)

PREMISES ALARM SYSTEM DISCOUNT

The companies referred to on page 336 install burglar alarm systems protecting the premises. The alarm systems are designated number 1, 2 or 3 in accordance with the following definitions of the extent of protection.

Installation No. 1. Alarm system protecting completely all windows, doors, transoms, skylights and other openings leading from the premises, and all ceilings, floors, and hall, party, partition and building walls enclosing the premises, except building walls which are exposed to street or public highway, and except that part of any building wall which is at least two stories above the roof of an adjoining building.

Installation No. 2. Alarm system protecting with traps all inaccessible windows; with screens (or foils and traps) all accessible windows (except stationary show windows), doors, transoms, skylights and other openings leading from the premises, and also

(a) protecting all ceilings and floors not constructed of concrete, and all hall, party and partition walls enclosing the premises, or

(b) providing a network of invisible beams to subdivide the floor space of each floor or separate section of the protected area into three approximately equal areas, and more where necessary to provide at least one subdivision per 1,000 sq. ft. of floor space,

or an alarm system protecting with supervisory contacts only all movable openings leading from the premises, and providing a system of invisible radiation to all sections of the enclosed area, so as to detect movement of a person walking not more than four consecutive steps at a rate of one step per second—such four step movement shall constitute a "trial" and a sufficicnt number of detection units shall be installed so that, upon test, an alarm will be initiated in at least three out of every four such consecutive "trials" made moving progressively throughout the protected area.

BURGLARY MANUAL

[fol. 1580]

MERCANTILE OPEN STOCK

DISCOUNTS (Continued)

10. PREMISES ALARM SYSTEM DISCOUNT (Continued)

Installation No. 3. Alarm system (a) protecting with screens (or foils and traps) all accessible windows (except stationary show windows), and all doors, transoms, skylights and other openings leading from the premises, or (b) protecting with contacts only all movable accessible openings leading from the premises and providing one or more invisible rays or channels of radiation with the minimum overall length of the rays or radiation equivalent to the longest dimensions of the area or areas so as to detect movement through the channel when a person walks across each channel at any point at the rate of one step per second, or (c) protecting with contacts all doors leading from the protected area or areas and providing a system of invisible radiation to all sections of the enclosed area so as to detect four-step movement as defined in the last paragraph of Installation No. 2 above.

If the premises are protected with an approved burglar alarm system installed by one of the companies listed on the stated territorial pages and the insured holds an unexpired Underwriters' Laboratories, Inc. certificate the following discount shall be allowed. The classification on the certificate governs the discount applicable.

BURGLARY MANUAL

	Installation	Stat.© Class. Code	Class A		Class B	
			Grade and Below Grade Floors	Above Grade Floor	Grade and Below Grade Floors	Above Grade Floor
Central Station with Keys	1	(--1-)	60	70	50	60
	2	(--2-)	50	60	40	50
	3	(--3-)	40	45	30	40
Central Station without Keys	1	(--1-)	50	55	45	50
	2	(--2-)	40	45	35	40
	3	(--3-)	30	35	25	30
Local	2	(--5-)	30	35	25	30
	3	(--6-)	20	25	15	20

Note:

(1) The reference to "keys" means that the central station alarm company located outside of the insured's premises has or has not keys to the insured's premises.

(2) The local system requires that a loud sounding gong or siren be located on the outside of the building containing the insured's premises.

© Number in parenthesis represents the third digit of the Stat. Class. Code.

Revised to June 20, 19

MERCANTILE OPEN STOCK

PREMISES ALARM SYSTEM DISCOUNT (Continued)

APPROVED BURGLAR ALARM COMPANIES

The companies installing approved local gong or siren burglar arms or central station burglar alarms for protecting premises e listed on the territorial pages for the state in which the arm company operates.

Companies installing local gong or siren burglar alarms for emises are designated "LP."

Companies installing central station burglar alarms for prem- s are designated "CSP."

The insured must hold an unexpired Underwriters' Labora- ries, Inc. certificate because some companies install both proved and unapproved systems.

POLICY AMENDMENTS

Forcible Exit From Premises
(Policy Form Statistical Code 20)

1.1 The policy may be extended to cover loss occasioned by meone hiding in the premises and making a forcible exit erefrom. The mercantile open stock burglary premium or the inimum premium, if applicable, shall be surcharged 20%. Use andard endorsement B 312.

Robbery Of Building Watchman, Janitor Or Porter
(Policy Form Statistical Code 20)

1.2 The policy may be extended to cover loss occasioned by bbery from a janitor or porter employed by the insured or uilding watchman who enters the premises. The gross mer- tile open stock burglary premium, before the application of discounts, or the minimum premium, if applicable, shall be harged 5%. Use standard endorsement B 313.

Consequential Damage
(Policy Form Statistical Codes
Burglary—Code 20; Theft—Code 26)

1.3 The policy may be extended to cover loss by consequen- l damage to a part of a garment at one or more other loca- ns occasioned by loss of or damage to a part of the garment the premises defined in the policy. The mercantile open stock emium or the minimum premium, if applicable, shall be sur- rged 25%. Use standard endorsement B 314.

Such coverage as respects a part of the garment in the prem- es defined in the policy is provided in the policy for no addi- nal premium.

MERCANTILE SAFE

DISCOUNTS (Continued)

12. TEAR GAS SYSTEM DISCOUNT

The following discounts shall be allowed where the safe vault is equipped with an approved tear gas system listed he under provided the insured holds an unexpired Underwrite Laboratories, Inc. certificate. Use standard endorsement B or B 402/502.

20%—Complete system protecting the top, bottom, all side and outer door(s) of the safe or vault.

10%—Partial system protecting (a) the combination an connections to the combination lock with or without pro tection on the full surface of the outer door(s) of a safe, or (b) the combination and connections to the combination lock and the full surface of the outer door(s) of a vault.

Approved Tear Gas Systems

Federal Laboratories, Inc., Pittsburgh, Penn.

Lake Erie Chemical Co., Cleveland, Ohio.

13. WATCHMAN DISCOUNT

No discount shall be allowed for more than three watchm at any one premises. Use standard endorsement B 402 B 402/502.

30%—For each private watchman employed exclusively the insured, who will be on duty within the premises of t insured at all times when said premises are not regularly op for business, and who will make at least hourly rounds a signal at least hourly in the insured's premises to a centr station located outside the insured's plant or to a police stati provided there is at least one regular policeman on duty there at all times.

15%—For each such watchman who does not signal to outside station, but who registers at least hourly on a watc man's clock in the insured's premises.

10%—For each such watchman who does not signal to outside station or register on a watchman's clock.

One half the regular discount shall be allowed for any su watchman who is not on duty during the daytime of Saturda or one other weekday when the premises are not open f business.

★14. PREMISES ALARM SYSTEM DISCOUNT—FORCIBLE ENTRY INTO PREMISES AND SAFE

If the premises are protected with a burglar alarm syste installed by one of the approved companies listed on the sta territorial pages as applying to the mercantile open stock se tion, and the insured holds an unexpired Underwriters' Labor tories, Inc. certificate, the **Above Grade Floor** discounts in t mercantile open stock section shall be allowed. The classific tion on the certificate governs the discount applicable. U standard endorsement B 409 or B 409A and B 402 or B 402/5

★ Change effective November 2, 1960 Revised to November 2, 19

[fol. 1583]

MERCANTILE SAFE

DISCOUNTS (Continued)

SAFE AND VAULT ALARM SYSTEM DISCOUNT

If a safe or vault is protected with an approved burglar alarm system installed by one of the approved companies listed in the state territorial pages and the insured holds an unexpired Underwriters' Laboratories, Inc. certificate, the following discounts shall be allowed. The classification on the certificate governs the discount applicable. Use standard endorsement B 402 or B 402/502.

INSTALLATION	CLASS A	CLASS B
Complete System protecting the top, bottom, all sides and outer door(s) of the safe or vault and connected with:		
(1) an outside central station		
Where keys to insured's premises are in possession of the alarm company.....	70%	60%
Where keys to insured's premises are not in possession of the alarm company.....	52%	45%
(2) a loud sounding gong or siren on the outside of the building.....	35%	30%
Partial System protecting the locking or bolt mechanism, or the lining of the outer door(s) (but not attached to lining of safe or vault walls) and connected with:		
(1) an outside central station		
Where keys to insured's premises are in possession of the alarm company.....	30%	25%
Where keys to insured's premises are not in possession of the alarm company.....	27%	22%
(2) a loud sounding gong or siren on the outside of the building.....	25%	20%

[fol. 1584]

IN THE UNITED STATES DISTRICT COURT

GOVERNMENT EXHIBIT No. 6

APPROVED EQUIPMENT

for

INDUSTRIAL FIRE PROTECTION

1962-1963

ASSOCIATED FACTORY MUTUAL FIRE INSURANCE COMPANIES

WHEN YOU ORDER, SPECIFY "FACTORY MUTUAL APPROVED"

1925

1586]

APPROVED EQUIPMENT

FOR INDUSTRIAL FIRE PROTECTION

YOUR GUIDE

TO PLANNING PROTECTION AND SPECIFYING EQUIPMENT PURCHASES

Selection and purchase of fire-protective equipment must be based on assurance that the devices specified are suitable for the intended use and are of a quality and reliability to give good service.

The approval testing and listing service offered by the Factory Mutual Engineering Division provides an authoritative guide in selecting appropriate equipment. Take advantage of the service. Always consult this manual before purchasing fire-protective equipment and look for the FM diamond.

Most Factory Mutual approved equipment bears the distinctive ◀FM▶ mark, or its modified design ◀FM▶. When you see it on a fire hose, fire extinguisher, hydrant, valve, or other device you know the equipment is well designed, well built, and thoroughly tested. Approved devices not carrying the mark can be identified by the manufacturer's name and model or catalog number.

Price $3.00

1962 - 1963

FACTORY MUTUAL ENGINEERING DIVISION

1151 Boston-Providence Turnpike, Norwood, Mass.

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Associated Factory Mutual Fire Insurance Companies

[fol. 1586]

When Fire STRIKES!

... be ready with the best, with Factory Mutual approved equipment

When you're dealing with employees' safety or the safety of your plant, you can't afford to compromise. You've got to be sure you're ready with the best fire-fighting equipment available.

Every piece of equipment approved by the Factory Mutuals has been examined and tested to the extent necessary to make sure it will function as intended. Enjoy the peace of mind that comes from proper preparedness.

Types of Devices Tested. Two general classes of equipment are listed: those used for the control and extinguishment of fire and the prevention of explosion, and those that in themselves would present serious fire or explosion hazards if not properly safeguarded. No attempt is made to approve all fire-protection appliances on the market, but reasonable selection is assured by the inclusion of products of a number of reputable manufacturers in each category.

We are grateful to the manufacturers who have supplied illustrative material. Pictures selected show typical devices and do not indicate special merit for a particular make. Nor is the order of listing indicative of comparative merit; it is entirely alphabetical.

Checks on Reliability. Before approval is granted, sample units from the manufacturer's regular production are subjected to careful examination and thorough laboratory tests. Continuance of approval depends on satisfactory performance in the field. Actual operation of the approved devices is checked during the periodic plant inspections by our engineers and through engineers' reports on performance in actual use. As a condition of approval, manufacturers may not make a change in the equipment without prior authorization by the Factory Mutual Engineering Division.

Replacement Parts for Approved Devices. Manufacturers are required to provide adequate facilities for service and parts replacement. When approved equipment needs repair, use only replacement parts made or recommended by the manufacturer. Otherwise, reliability of the device may be adversely affected.

"Approval" and "Acceptance." Distinction should made between Factory Mutual approval and Factory Mu acceptance. "Approval" refers to a device or equipment w has been tested and found suitable for general applica subject to any limitations stated in the approval and usual the listing. "Acceptance" refers to a specific installation arrangement of devices or equipment. Devices listed in manual are "approved"; installations incorporating them vices, if found satisfactory following review of plans inspection of completed work, are "accepted."

How to Use This Manual. Before purchasing protection equipment, consult this manual to determine suitability of the particular device for the desired use. consult the manufacturer's catalogs. When ordering, spe the particular device as listed.

Contracts for fire-protection installations should spe that approved devices be used, as applicable, and that installations be made suitable for Factory Mutual accepta

How the Manual Is Distributed. This list of curre approved equipment is revised and republished annually. copy is sent to all properties insured in the Factory Mut Companies, as a loss-prevention service. The manual is a available for purchase at $3.00 a copy. Address orders the Factory Mutual Engineering Division, 1151 Bost Providence Turnpike, Norwood, Mass.

Factory Mutual Responsibility Limit. Approval of device does not imply any warranty by the Factory Mut Engineering Division against defects or failure in service, any responsibility in regard to patent infringements. T Associated Factory Mutual Fire Insurance Companies will liable only for losses directly covered by their policies.

AUTOMATIC SPRINKLER SYSTEMS

...matic sprinkler protection is recommended for ...rial and other buildings having combustible con... or combustible occupancy.

...re are several approved types of automatic ...lers: upright and pendent, flush-type, sidewall, ...dry pendent.

...roved automatic sprinklers have a discharge ...approximately ½-in. in diameter (except see ...ecial type). Discharge rate in gallons per ...ute may be calculated by multiplying the square ...t of the operating pressure by the factor 5.7.

...lers operate automatically when the heat-...ive element is exposed to temperatures equal to ...wn their thermal rating. Except for the dry-...dent and flush types, the fusible element can be ...ted so that they may be used as open sprinklers.

...lection of the proper temperature rating for auto-...ic sprinklers is important. The proper rating pro-...s a factor of safety designed to prevent premature ...ation from gradual weakening of the heat-actuated ...ent when exposed to elevated temperatures near ...temperature rating. Sprinklers with heat-actuated ...ents of ordinary temperature rating are suitable ...for locations where the highest temperatures do ...exceed 100°F. Sprinklers with temperature ratings ...than 160°F. should be installed only in buildings of ...upancy such as offices, showrooms, hotels, schools, ...itals, apartment houses, and dormitories. They ...ld not be installed in manufacturing or storage areas ...ept following a special study and acceptance by the ...tory Mutual Engineering Division.

...for high temperature locations such as over hot proc-..., in blind attics, under monitors, skylights and un-...ated metal roofs, and near radiators or other heating ..., select proper temperature rating from the following ...:

...Temperature ...Sprinkler Level	*Rated Temperatur: of Sprinkler*	*Frame Color*
...to 100°F.	135°*, 160° to 175°F.	Unpainted**
125°F.	175° to 212°F.	White
175°F.	250° to 286°F.	Blue
225°F.	325° to 360°F.	Red
275°F.	400° to 415°F.	Green
325°F.	500°F.	Orange

...the preceding paragraph.
...ptions: "Special," 175°F. Frame is painted white. Frame arms of 135° ...ersal" sprinklers are half black and half unpainted.

...Where corrosive atmospheres are likely, a specially ...pared wax coating affords the most effective and ...omical protection for sprinklers. *Wax-coated heads* may be obtained from any manufacturer of approved sprinklers at a small increase in cost. *Lead-coated heads* also are obtainable, and are effective in certain mild corrosive atmospheres.

Working plans of proposed layouts, showing all details with respect to location of sprinklers, piping, a description of the occupancy, and details of construction, should be sent to your insurance company for review before the materials are fabricated. The plans will be accepted or changes will be recommended to assure that the work will be done in accordance with the best practice and, to avoid the possibility of later requests for changes. Complete information on recommended standards may be found in the Factory Mutual publication, "Installing Sprinkler Equipment."

AUTOMATIC SPRINKLERS, Standard

Listed automatic sprinklers (except sidewall sprinklers) are known as "standard sprinklers." Their design is based on a development of Factory Mutual research and the protection provided is markedly superior to the "old-type sprinklers," the term by which sprinklers manufactured prior to 1952 are known.

Standard sprinklers have deflectors specially designed to discharge the water in all directions below the plane of the deflector. Thus, the spray pattern is roughly that of a half sphere completely filled with water spray. Little or no water is discharged upward to wet the ceiling. The distribution at any level below the head is much more uniform than that of the old-type sprinkler and covers a circular area at a distance 4 feet below the deflector with a diameter of about 16 feet even when discharging at only 15 gallons per minute. The area covered is greater at distances over 4 feet and is less with a lesser clearance.

Upright standard sprinklers cannot be inverted for use in the pendent position; special approved pendent standard sprinklers are required. (Wide-angle ½-inch pendent automatic spray nozzles approved for flammable liquids or other special hazards may not meet the standards for pendent standard sprinklers.) Pendent sprinklers are recommended for use only in locations where it is impractical to use sprinklers in the upright position.

All standard sprinklers are marked on the top of the deflector to indicate whether for use upright, "Upright-SSU," or pendent "Pendent-SSP." They are also

marked to show the manufacturer's name or initials, the model number, date, and temperature rating.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Type 38-400B (upright), 38-700B (pendent). 165°, 212°, 286°, 360°.

"Automatic" Sprinklers of the Pacific Inc 720 West 17th St Costa Mesa Cal
Pacific Type B. Specify upright or pendent. 160°, 212°, 286°, 360°.

C S B Sprinkler Co 32 Cook Ct Laconia N H
C S B Type A (upright), Type B (pendent). 165°, 212°, 280°, 360°.

Central Automatic Sprinkler Co Inc Fourth St and Cannon Av Lansdale Pa
Central Type D. Specify upright or pendent. 165°, 212°, 286°, 360°.

Fire Protection [illegible]01 S Narragansett Av Chicago Ill
FPC Type B. Specify upright or pendent. 165°, 212°, 286°, 360°.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Globe Saveall Type D. Specify upright or pendent. 135°, 160°, 212°, 280°.

Grinnell Corp Providence R I
Duraspeed Solder-type, Issue C. Specify upright or pendent. 165°, 212°, 286°, 350°.
Quartzoid Bulb-type, Issues C and D. Specify upright or pendent. 135°, 175°, 250°, 325°, 400°, 500°.

Grinnell Co of Canada Ltd 2440 Dundas St NW Toronto Ont
Duraspeed Solder-type, Issue C. Specify upright or pendent. 165°, 212°, 286°, 350°.

Hodgman Mfg Co Taunton Mass
Hodgman Type D. Specify upright or pendent. 165°, 212°, 286°, 360°.

Hythercanics Inc 1319 Potrero Av El Monte Cal
Afcon Issue A (upright). 165°, 212°, 286°, 360°.

Raisler Corp 750 Third Av New York 17 N Y
Grimes Model D. Specify upright or pendent. 165°, 212°, 286°, 360°.

Reliable Automatic Sprinkler Co Inc 325 N MacQuesten Pky Mt Vernon N Y
Reliable Issue C. Specify upright or pendent. 160°, 212°, 280°, 360°.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Type TU-57 (upright), TP-57 (pendent). 160°, 212°, 286°, 360°.

Star Sprinkler Corp Westmoreland and Collins Sts Philadelphia 34 Pa
Stargard Model D. Specify upright or pendent. 135°, 165°, 212°, 286°, 360°.

Superior Automatic Sprinkler Co Inc 444 St Marks Pl Staten Island N Y
Superior Type B. Specify upright or pendent. 165°, 212°, 286°, 360°.

Viking Corp Hastings Mich
Viking Type C. Specify upright or pendent. 160°, 212°, 280°, 360°.

H G Vogel Co 1101 Slocum Av Ridgefield N J
Vogel Type A. Specify upright or pendent. 165°, 212°, 280°, 360°.

AUTOMATIC SPRINKLERS, Large-orifice Standard

Large-orifice standard sprinklers are similar to standard sprinklers except that the orifice is 17/32 and they discharge 40% more water. Multiplying square root of the operating pressure by the factor gives the discharge rate (gpm). The greater capacity is useful in some situations where very high density required. Special-size piping systems are needed.

The sprinklers fit ¾-in. pipe fittings and this helps to identify them.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Type 38 B. Specify upright or pendent. 212°, 286°, 360°.

Grinnell Corp Providence R I
Duraspeed Issue C, SSU-1 (upright). 165°, 212°, 286°, 360°.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Type TU-80 (upright). 160°, 212°, 286°, 360°.

Viking Corp Hastings Mich
Viking Type C (upright). 160°, 212°, 280°, 360°.

AUTOMATIC SPRINKLERS, Flush-type Standard

Flush-type automatic sprinklers are intended for use with a concealed piping system, and are installed in pendent position, with a plate on the base flush with the ceiling. The operating element extends only a short distance below the ceiling. These sprinklers are intended for use where attractive appearance under decorative ceiling is desired in such occupancies as offices, hotel lobbies, dining rooms, clubs and similar properties.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Flush-type 38-400.

Central Automatic Sprinkler Co Inc Fourth St and Cannon Av Lansdale Pa
Recess Adapter for Central Type C sprinkler.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Recess Adapter. Models A, B. For Globe Type D sprinkler.

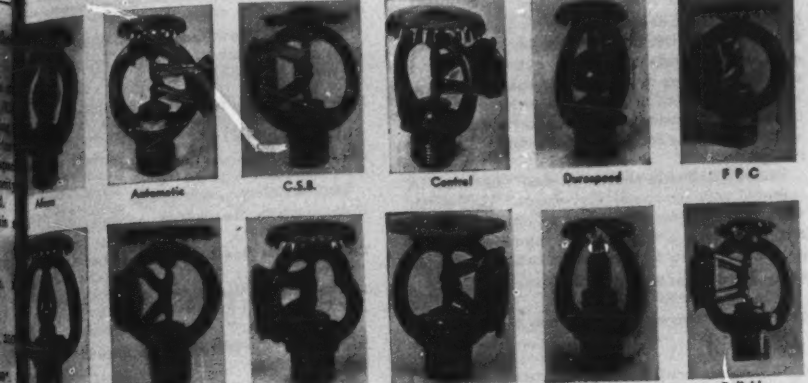
Grinnell Corp Providence R I
Quartzoid Ceiling-type, Issue D.

Star Sprinkler Corp Westmoreland and Collins Sts Philadelphia 34 Pa
Recess Adapter for Stargard Model D sprinkler.

Viking Corp Hastings Mich
Viking Flush-type D.

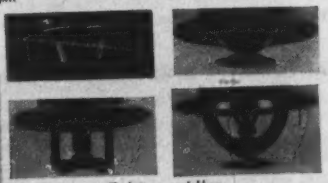
AUTOMATIC SPRINKLERS, Sidewall

Sidewall automatic sprinklers are equipped with a special deflector which discharges most of the water in a forward direction. They are special-purpose heads, originally developed for locations such as executive offices, hotel lobbies, and dining rooms, where the



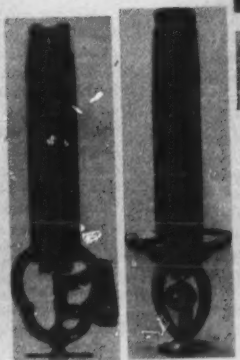
Standard automatic sprinklers, upright.

...right and pendant sprinklers of the same ...del differ only in the deflector design.

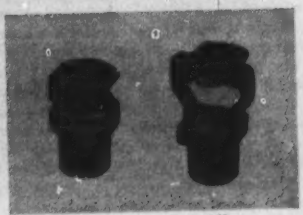


Flush-type sprinklers.

Sidewall sprinklers.



Dry-pendent sprinklers.



Window and cornice sprinklers.

installation of standard sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. Installed near the junction of the ceiling and wall, they are satisfactory for light hazards and where ceiling protection is not an important factor; also for special applications where their directional properties are desirable. They are made in all standard temperature ratings.

Sidewall sprinklers similar to those illustrated are approved only for special applications. They should not be used in place of standard sprinkler equipment, and full information should be submitted to your insurance company for review prior to installation.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Type 38B.

Central Automatic Sprinkler Co Inc Fourth St and Cannon Av Lansdale Pa
Central Type C.

Globe Automatic Sprinkler Co Div of Pyr-Fyter Co Route 1 Box 750 Newark 1 N J
Globe Saveall Type D.

Grinnell Corp Providence R I
Quartzoid Bulb-type, Issues C and D.

Hodgman Mfg Co Taunton Mass
Hodgman Type D.

Reliable Automatic Sprinkler Co Inc 525 N MacQuesten Pky Mt Vernon N Y
Reliable Issue C

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Type D.

Star Sprinkler Corp Westmoreland and Collins Sts Philadelphia 34 Pa
Stargard Model D.

Viking Corp Hastings Mich
Viking Type C.

AUTOMATIC SPRINKLERS, Dry-pendent Standard

The dry-pendent automatic sprinkler consists of an approved pendent standard sprinkler permanently secured in an extension nipple which has a valve at the inlet end to prevent water from entering the nipple until the sprinkler operates. The valve end of the nipple is screwed into a fitting in the piping above the ceiling or enclosure, thus taking the place of a drop-pipe. The heads are obtainable in standard temperature ratings.

The purposes of the device are: (1) to eliminate possible freezing due to the collection of condensation in the drop-pipe, (2) to eliminate the necessity of removing sprinklers installed pendent in a dry-pipe system for the purpose of draining after the valve has tripped, and (3) to provide a device for use in conjunction with a wet system where the sprinkler lines are in a heated section and it is desired by the use of drop-pipes to protect unheated areas such as store windows.

These sprinklers are approved for limited service, plans should be submitted to your insurance comp for review prior to installation.

Globe Automatic Sprinkler Co Div of Pyr-Fyter Co Box 750 Newark 1 N J
Globe Saveall Type D.

Grinnell Corp Providence R I
Duraspeed Solder-type, Issue C.
Quartzoid Bulb-type, Issues C and D.

Hodgman Mfg Co Taunton Mass
Hodgman Issue B-1

Raisler Corp 750 Third Av New York 17 N Y
Grimes Model D.

Reliable Automatic Sprinkler Co Inc 525 N MacQueste Mt Vernon N Y
Reliable Issue C.

Star Sprinkler Corp Westmoreland & Collins St Philadelp Pa
Stargard Model D-1.

Viking Corp Hastings Mich
Viking Type C.
Viking Flush-type C.

OPEN SPRINKLERS

All of the approved standard sprinklers listed preceding sections are approved for use as op sprinklers by omission of the operating parts. T are used principally in deluge systems where it desirable to deliver water through all sprinklers sim taneously, as described under special sprinkler syste

OPEN SPRINKLERS, Window, Cornice

Window and cornice sprinklers are open heads, signed to protect windows and combustible corni against outside exposing fires.

Window and cornice sprinklers have no automa fusible element feature. Their operation depends usua on the opening of a control valve by hand, altho they are sometimes automatically controlled with thermostatically operated deluge valve. For compl protection of windows, sprinklers should be so arrang that they will wet the entire surface of the glass.

Any considerable number of open sprinklers requi a large volume of water.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Window Sprinklers. Type A. ¼, 5/16, ⅜ in.
"Automatic" Window Sprinklers. Type B. ¼, 5/16, ⅜ in.
"Automatic" Cornice Sprinklers. ⅜ in.

Central Automatic Sprinkler Co Inc Fourth St and Cannon Lansdale Pa
FM Window Sprinklers. ½, ⅝, ¾ in.
FM Cornice Sprinklers. ½, ⅝ in.
Central Window Sprinklers. ¼, 5/16, ⅜ in.

Protection Co 6601 S Narragansett Av Chicago Ill
M Window Sprinklers. ½, ⅝, ¾ in.
M Cornice Sprinklers. ½, ⅝ in.

Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 ox 729 Newark 1 N J
ite Window Sprinklers. ¼, 5/16, ⅜ in.
ite Window Sprinklers. Type B. ½, ⅝, ¾ in.
ite Cornice Sprinklers. Type B. ½, ⅝ in.

ell Corp Providence R I
M Window Sprinklers. ½, ⅝, ¾ in.
M Cornice Sprinklers. ½, ⅝ in.
ell Window Sprinklers. ¼, 5/16, ⅜ in.
ell Cornice Sprinklers. ⅜ in.

gton Mfg Co Taunton Mass
M Window Sprinklers. ½, ⅝, ⅞ in.
M Cornice Sprinklers. ½, ⅝ in.
gton Window Sprinklers. ¼, 5/16, ⅜ in.

er Corp 750 Third Av New York 17 N Y
ton Window Sprinklers. Model A. ¼, 5/16, ⅜ in.

Automatic Sprinkler Co Inc 525 N MacQueston Pky Vernon N Y
M Window Sprinklers. ½, ⅝, ¾ in.
M Cornice Sprinklers. ½, ⅝ in.
able Window Sprinklers. Type A. ¼, 5/16, ⅜ in.

wood Sprinkler Co 36 Harlow St Worcester Mass
M Window Sprinklers. ½, ⅝, ¾ in.
M Cornice Sprinklers. ½, ⅝ in.
lwood Window Sprinklers. ¼, 5/16, ⅜ in.

ing Systems Company 3201 Randolph St Bellwood Ill
ooling Nozzles. ½K60 (17/64 in.). ½K80 (5/16 in.). 20 (¼ in.). ½K120 (⅜ in.).

Sprinkler Corp Westmoreland and Collins Sts Philadelphia 34 Pa
w Window Sprinklers. ¼, 5/16, ⅜ in.

g Corp Hastings Mich
M Window Sprinklers. ½, ⅝, ¾ in.
M Cornice Sprinklers. ½, ⅝ in.
ing Window Sprinklers. ¼, 5/16, ⅜ in.

RINKLER GUARDS

Designed to protect automatic sprinklers from mechanical injury. Can be used when sprinklers are right or pendent.

ell Corp Providence R I

ton Wire Goods Co Marlboro Mass.

RINKLER HANGERS

Consult Factory Mutual publication, "Installing rinkler Equipment" for application and installation ails.

ion Manufacturing Co 9 Lexington Drive Croton-on-Hudson N Y
Adjustable-swivel Pipe Ring. Figs. 1, 2. ⅜ to 8 in.
Adjustable-swivel Pipe Ring. Fig. 3. ¾ to 2 in.
Short-shank Pipe Ring. Fig. 4. 1 to 2 in.
C-clamp with Locknut. Fig. 5A. ⅜, ½, ⅝, ¾ in.
Flat C-clamp with Locknut. Fig. 6A. ⅜ in.
Side-beam Clamp with Locknut. Fig. 8A. ⅜, ½, ⅝, ¾ in.
Side-beam Bracket. Fig. 9. ¾ to 2 in.
C-clamp with Retainer Clip. Fig. 57. ⅜, ½, ⅝, ¾ in.
Offset C-clamp with Retainer Clip. Fig. 67. ⅜ in.
Side-beam Clamp with Retainer Clip. Fig. 87. ⅜, ½, ⅝, ¾ in.

Apex Bolt Products Co 453-459 W Clermont Ave Chicago 12 Ill
Clip Bases.
Rod Couplings.
C-clamp. Styles 2 and 3. ⅜, ½, ⅝, ¾ in.
U-hangers.
Hanger Rods.
Swivel Pipe Rings.
Solid Clip Rings.

"Automatic" Sprinkler Corp of America Youngstown O
U-hangers. Nos. 1, 2, 3. 1 to 3 in.
U-hanger. No. 4. 3½ to 8 in.
Clip Hanger. No. 5. 1 to 2 in.
Swing Clip. No. 6. 2½ to 8 in.
Beam Hanger. No. 8. 1 to 8 in.
Beam Hanger. No. 9. 1 to 8 in.
Lag-end Hanger. No. 10. 1 to 6 in.
Pipe-hanger Assemblies. Nos. 12, 13.
I-beam Clamp Hangers. Nos. 14R, 14RC.
Concrete-slab Hanger. No. 16. 1 to 8 in.
Wall-bracket Hanger. No. 17A. ¾ to 3½ in.
Wall-bracket Hanger. No. 18A. 3 to 5 in.
Wall-bracket Hanger. No. 18B. 6, 8 in.
Adjustable-swivel Ring. No. 19-400A. ¾ to 8 in.
Clip Hanger No. 21. ¾ to 4 in.
Wall-strap Hanger. No. 23. 1 to 2½ in.

Carpenter & Paterson Inc 18 Hurley St Cambridge Mass
Top-Beam Clip. Fig. 6. 1 to 8 in.
Adjustable Beam Clamp. Fig. 14.
Lag-screw Hanger Rod. Fig. 28.
Spring Hanger. Fig. 7. ¾ to 3½ in.
Adjustable Swivel-ring Pipe Hanger. Fig. 800. ¾ to 2 in.
U-hook. Fig. 44.
C-clamp with cup-pointed set screw and locknut. Fig. 47. ⅜ to ¾ in.
Extension Clamp. Fig. 64. 1 to 2 in.
Clevis Hanger. Fig. 100.
Solid Ring. Fig. 105.
Clip-ring Assembly. Fig. 106.
Clip Base. Fig. 116.
Adjustable Beam Clamp. Fig. 146.
Ceiling Flange. Fig. 185.
Solid Ring and Swivel. Fig. 233.
C-clamp with Retainer Clip. Fig. 238-A. ⅜, ½, ⅝, ¾, ⅞ in.
Swivel Pipe Ring, Split. Fig. 240.
Adjustable Steel-swivel Ring. 1 to 8 in.

Eicen Metals Products Co Inc 9325 W King St Franklin Park Ill
Steel Pipe Clamp. No. 1. ¾ to 8 in.
Adjustable Swivel Ring. No. 8. ¾ to 2 in.
Solid Ring. No. 9. ¾ to 2 in.
U-hanger. No. 11. ¾ to 8 in.
Clevis Hanger. No. 12. ¾ to 8 in.
Adjustable Steel Pear Hanger. No. 13. ¾ to 8 in.
C-clamp and Ring. No. 23A. ¾ to 2 in.
Extension C-clamp. Nos. 26, 26A. ¾ in.
C-clamps. Nos. 29, 29A. ⅜, ½, ⅝, ¾ in.
Pipe Hanger. No. 89. ¾ to 8 in.
Split-ring Hanger. No. 92. ¾ to 8 in.
Adjustable Steel-band Hangers. No. 94. ¾ to 2 in.
Beam Clamp. No. 233. Channel Clamp. No. 234. Socket. No. 235. ¾ to 8 in. Limited to installations where sprinkler piping must be suspended from sloping I-beam or channel construction.
Channel Clamp. No. 236. ¾ to 8 in.
Flange-beam Clamp. No. 237. ½ to 8 in.

Fee & Mason Mfg Co Inc Manasquan N J
Adjustable Swivel Ring. Fig. 198. ⅜ to 8 in.
Clevis Hanger. Fig. 230. 2 to 8 in.
Clevis Hanger. Fig. 250. ⅜ to 4 in.
C-clamp. Fig. 255. ⅜, ½, ⅝, ¾ in. With retainer clip, Fig. 255S. With cup-pointed set-screw and locknut, Fig. 255L.
Solid Ring. Fig. 256. ⅜ to 2 in.

Fire Protection Company 6601 Narragansett Ave Chicago 38 Ill
Clip Ring. Type A. 1 to 2 in.
Clevis Hanger. Type B. 2½ to 8 in.
I-Beam-and-channel Iron Clamp. Type C. 1 to 8 in.

Grabler Mfg Co 6565 Broadway Cleveland O
Ceiling Plate. Fig. 46.
Clevis Hanger. Fig. 97.
Adjustable Clip Ring. Fig. 208.
Solid Hanger. Fig. 351.
Side-opening Hinge Hanger. Fig. 352.
Adjustable Steel Hanger Ring. Fig. 367. ⅜ to 3½ in.

Grinnell Corp Providence R I
Bar-joist Clip. Fig. 67. 1 to 3½ in. To be used with extension piece (Fig. 187) or with ½ in. extension eye bolt (Fig. 220), 2½ to 3½ in. No. 1 for use on ½ and ⅝ in. bars. No. 2 for use on ¾ and ⅞ in. bars.
U-bolt Beam Clip. Fig. 68. 1 to 8 in.
Beam Clip. Fig. 68S. 1 to 5 in.
U-bolt Channel Clip. Fig. 69. 1 to 8 in.
Channel Clip. Fig. 69S. 1 to 5 in.
Extension C-clamps. Figs. 83, 84, 85.
C-clamp. Figs. 86, 87, 88.
Structural Steel Clamps. Figs. 92, 93. ⅜ to 4 in. For use on installations where roof construction has a natural pitch to allow for drainage.
C-clamp and Ring. Fig. 94. To be used on installations where roof construction has a natural pitch to allow for drainage.
Wrought-steel Pipe Ring. Fig. 97. ⅜ to 8 in.
Adjustable Swivel Rings. Figs. 101, 104.
Adjustable Clip. Fig. 106.
Adjustable Clip Base. Fig. 110. ⅜ to 2 in.
I-beam Clamp. Fig. 131.
Hanger-rod Coupling. Fig. 136.
Swivel Ring. Fig. 150.
Pipe-hanger Flange. Fig. 153.
Swivel-hanger Flange. Fig. 154.
Adjustable Swinging Flange. Fig. 155.
Hanger Clip. Fig. 193. 1 to 3½ in.
Light Welded Steel Bracket. Fig. 194. 1 to 6 in.
Side-beam Bracket. Fig. 202.
Side-column Bracket. Fig. 203.
U-hooks. Fig. 205. Wrought steel.
Wrought Pipe Clamp. Fig. 212. ⅜ to 8 in.
I-beam Clamp. Fig. 218. 1 to 8 in. With extension piece (Fig. 157) or extension eye bolt (Fig. 220).
Channel-iron Bracket. Figs. 221, 223.
Side-beam Clamp. Fig. 225.
Universal Channel Clamp. Fig. 226. ⅜ to 8 in. with extension piece (Fig. 157) or extension eye-bolt (Fig. 220). Limited in application to installations where sprinkler piping must be suspended from sloping channel construction.
Top Beam Clamp. Fig. 227. ⅜ to 2 in.
Pear-shaped Ring. Fig. 232.
Clevis Hanger. Fig. 260.
Short and Long Clips. Figs. 262, 263.
Simplex Side I-beam Clamp. Fig. 265. ⅜ to 8 in.
Simplex Channel Clamp. Fig. 266. ⅜ to 8 in.
Simplex Top-beam Clamp. Fig. 267.
Adjustable Wrought Band Hanger. Fig. 269G. ⅜ to 8 in.
Swinging Top-beam Clamp. Fig. 270. With extension (Fig. 157). ⅜ to 8 in. Limited to installations where piping must be suspended from the sloping top of an truss or I-beam.

New England Hardware Mfg Co 289 Riverside Dr York N Y
Adjustable Swivel Ring. Fig. 308. 1 to 2 in.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
I-beam Offset Hanger. Figs. 1, 2, 3. Type C-I.
Lag-end Hanger. No. 2. ⅜ to 6 in.
Swing Hanger Plates. No. 3. 2½ to 6 in.
Clip Rings. ⅜ to 2½ in.
U-hanger for Bar Joists. 1 to 2 in.
U-hanger. 1 to 6 in.
Short-pattern Clip Ring. 1 to 2½ in.
C-clamp. No. 8. 1 to 6 in.
Offset C-clamp. No. 8. Types I, II. ⅜ to 2 in.
Pipe Hanger. No. 8-S. 1 to 2 in.
Side-beam Hanger. No. 9. 1 to 8 in.
Pressed-steel Foot Piece. 1 to 2½ in.
Top-beam Clamp. No. 11. ⅜ to 8 in.
Beam Clamp. No. 12. Type A. 1 to 8 in.
Worcester Hanger. ⅜ to 6 in.
Pipe Hanger. No. 14-S. 1 to 2 in.
Wall-bracket Hanger No. 200. 1 to 3½ in.
Wall-bracket Hanger No. 210. 1 to 2 in.

EXPANSION SHIELDS

Expansion shields are used for supporting pipes in concrete construction. Holes should be drilled to proper size and depth, with care to provide for a u form contact with the shield over its entire circu ference. Use a ⅜-inch shield for pipes 2 inches smaller, a ½-inch shield for 2½- and 3½-inch pipe ⅝-inch shield for 4- and 5-inch pipe, a ¾-inch shi for 6-inch pipe, and a ⅞-inch shield for 8-inch pipe.

Apex Bolt Products Co 452-458 N Claremont Av Chicago 12
Apex Closed-back Expansion Cases. ⅜, ½, ⅝, ¾ in.

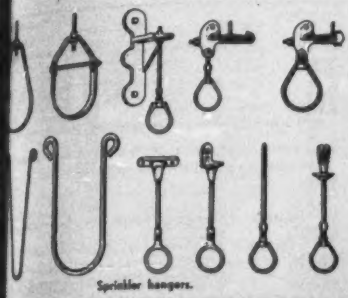
Arro Expansion Bolt Co Marion O
Type A-C-L. Series 2000. ⅜, ½, ⅝, ¾ in.
Silver King Self-drilling Expansion Shields. Series K500 flu type (⅜, ½, ⅝, ¾ in.). Series K600 snap-off type (⅜, ½ ¾, ⅞ in.). Series K700 rod-hanger type (⅜, ½, ⅝, ¾, ⅞ in.).

Bulldog Construction Specialties Corp 2900-30 West 26th Chicago 23 Ill
Bulldog Self-drilling Expansion Shells. Series 100 flush-t (⅜, ½, ⅝, ¾ in.). Series 200 special flush-type (⅜, ½, ⅝ ⅞ in.). Series 300 rod-hanger type (⅜, ½, ⅝, ¾, ⅞ in.).

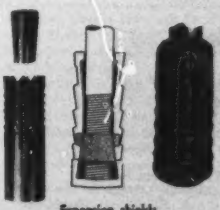
Diamond Expansion Bolt Co Inc Garwood N J
Cat. Nos. 3000, 3080, 3100, 3120. ⅜, ½, ⅝, ¾ in.
Cat. No. 1606-D. ⅜ in.
Cat. No. 1608-D. ½ in.
Blue-Cut Self-Drilling Anchors. Series B100 snap-off fl type (⅜, ½, ⅝, ¾, ⅞ in.). Series B200 flush-type (⅜, ½ ¾ in.). Series B300 rod-hanger type (⅜, ½, ⅝, ¾ in.).

Fastway Fasteners Inc Lorain O
Fastway Self-drilling Expansion Shells. Rod-hanger type ½, ⅝, ¾ in.). Flush-type (⅜, ½, ⅝, ¾ in.). Special flush-t (⅜, ½, ⅝, ¾, ⅞ in.).

Grinnell Corp Providence R I
Fig. 117. ⅜, ½, ⅝, ¾ in.

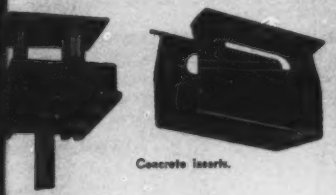


Sprinkler hangers.



Expansion shields.

Sprinkler guard.



Concrete inserts.

Explosive-driven fasteners.

Branch-line tester.

Manufacturing Company 2345 W Division St Chicago 22

Steel self-drilling Expansion Shells. Rod-hanger type (⅜, ½ in.). Flush-type (⅜, ½, ⅝, ¾ in.). Special flush-type (⅜, ½, ⅝, ¾ in.).

Steel Load Co Cinch Expansion Bolt Dept Box 831 Perth Amboy N J

Two-unit Standard Cinch Anchor. Types 1A, 2A. ⅜, ½, ⅝ in.

Two-unit Ring Wedge Cinch Anchor. Types 1, 2. ⅜, ½, ⅝ in.

Cinch Drive Sleeve. Type 28. ⅜, ½, ⅝ in.

Cinch Industries Inc 9701 S E McLoughlin Blvd Portland 22 Ore

Self-drilling Expansion Anchors. Flush Drill (⅜, ½, ⅝, ¾ in.). Steel Flush Drill (⅜, ½, ⅝, ¾, ⅞ in.). Rod Hanger Drill (⅜, ½, ⅝ in.).

Cooper Drill Co U S 12 at Liberty Trail Michigan City Ind

Steel Head Self-drilling Expansion Shells. Rod-hanger, flush, and snap-off types. ⅜, ½, ⅝, ¾, ⅞ in.

Phillips Anchor. Nos. J-38, J-12, J-58. ⅜, ½, ⅝ in.

Crawford Co Inc 200 Petersville Road New Rochelle N Y

Steel Rawlnut Anchors Type 66. ⅜, ½, ⅝ in. Installed with special expander.

Steel Saber-tooth Self-drilling Expansion Shells. Series 6000 snap-off flush type (⅜, ½, ⅝, ¾ in.). Series 6100 hand-flush type (⅜, ½, ⅝, ¾ in.). Series 6200 rod-hanger type (⅜, ½, ⅝, ¾, ⅞ in.).

Crockwood Sprinkler Co 38 Harlow St Worcester Mass

Rockwood No. 6. Phillips Self-drilling Expansion Shells. Rod-hanger and flush types.

Rockwood No. 7. U. S. Expansion Shield. Closed-back type.

Star Expansion Industries Corp Mountainville N Y

Slugin. Two-unit.

Star Tampin. Type 4000. ⅜, ½, ⅝, ¾ in.

Star Selfdril Shields. Chuck-end, flush-end, and rod-hanger types. ⅜, ½, ⅝, ¾, ⅞ in.

U S Expansion Bolt Co Box 827 York Pa

Closed-back type.

Ty-Ton (⅜, ½ in.).

Korker (⅜, ½ in.).

Drilfast Self-drilling Anchor. Taper-head, flush-head, and rod-hanger types. (⅜, ½, ⅝, ¾ in.)

CONCRETE INSERTS

Concrete inserts are used in new construction for supporting sprinkler piping with approved hangers. The inserts are set in concrete when it is poured.

"Automatic" Sprinkler Corp of America Youngstown O

No. 7. 1 to 8 in.

Carpenter & Paterson Inc 18 Hurley St Cambridge Mass

Witch. Figs. 24, 169 (malleable iron). Fig. 650 (steel). Fig. 75. ⅜, ½, ⅝ in.

Elcen Metals Products Co Inc 9325 W King St Franklin Park Ill

Nos. 64, 65. Malleable iron. With Fig. 65A nut. ¾ to 8 in.

Fee & Mason Mfg Co Inc Manasquan N J

Fig. 2570. ¾ to 8 in.

Grabler Mfg Co 6565 Broadway Cleveland O
Fig. 315.

Grinnell Corp Providence R I
Fig. 132. ⅜, ½, ¾, ¾, ⅞ in.
Figs. 279, 282.
Fig. 281. ¾ to 6 in.
Fig. 285. ¾ to 5 in.

Lancaster Malleable Casting Co Lancaster Pa
Insert No. 700-A, Insert Nut 701. ¾ to 8 in.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass

EXPLOSIVE-DRIVEN FASTENERS

Explosive-driven fasteners are used for attaching approved hangers to concrete and steel structural shapes. Because the powder-actuated tool used for driving these fasteners is a source of ignition, they must not be used where flammable liquids or light combustible materials are present.

The type of fastener and powder charge should be determined for each installation by making preliminary tests to obtain the most desirable combination to drive the fastener just short of full penetration.

Spot test at random at least 10% of each size fastener for holding power. Apply a minimum field-test load of 600 lb to fasteners for 1- to 2-in. pipe, 1,000 lb to fasteners for 2½-, 3-, and 3½-in. pipe, and 1,200 lb to fasteners for 4- and 5-in. pipe.

Concrete should be of sufficient thickness to prevent fastener from passing completely through the material. Fastenings should not be made nearer than 6 inches from an outside corner.

Fasteners should not be used in any structural steel having a thickness of less than 3/16 in. They should not be used in cast iron, hardened steel, stone or other very hard or brittle materials.

A locking nut should be furnished with each coupling to lock the coupling to the hanger rod.

The following fasteners are approved with the couplings listed.

Drive Pin Inc 1100 20th St N W Washington 6 D C
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
T-552	C-56	Concrete	2
T-554	C-56	Concrete	2
T-562	C-56	Steel	2
T-564	C-56	Steel	2
TH-554	C-68	Concrete	3½
TH-556	C-68	Concrete	3½
TH-557	C-68	Concrete	3½
TH-564	C-68	Steel	3½
TH-566	C-68	Steel	3½

TH-556 and TH-566 are also approved for horizontal installation. Maximum pipe size, 3½ in.

Gregory Industries Inc 28th St & Toledo Av Lorain O
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
NN66	N47004	Steel	2
NN60	N47004	Concrete	2
NN62	N47004	Concrete	2
NN63	N47004	Steel	2
NN62	N47004	Concrete	2
NN64	N47004	Concrete	2
NN66	N47004	Concrete	2
NN04	N47004	Concrete	2
NX43	N47002	Steel	2
NX44	N47002	Concrete	2
NX41	N47002	Concrete	2

NN04 is also approved for horizontal installation. Maximum pipe size, 2 in.

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
TA-97013	TA-99387-99380	Concrete	2
TA-97031	TA-99509-99380-99380	Concrete, Steel	2
TA-97009	TA-99387-99385	Concrete, Steel	2
TA-97010	TA-99386-99387	Steel	2
TA-97030	TA-99386-99387	Steel	2
TA-97016	TA-99386-99387	Concrete	2
TA-97031	TA-99385-99387	Concrete	2
TA-97097	TA-99606-99385-99380	Concrete, Steel	2
TA-97059	TA-99606-99385-99380	Concrete, Steel	2

TA-97013 is also approved for horizontal installation. Maximum pipe size, 3½ in.

TA-97019. For use in steel, horizontal installation only. Maximum pipe size, 3½ in.

Omark Industries Inc 9701 S E McLoughlin Blvd Portland 22
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
T-72	MB-6, MB-86	Concrete	2
T-73	MB-6, MB-86	Concrete	2
T-74	MB-6, MB-86	Concrete	2
T-42	MB-86, MB-6	Concrete	2
T-43	MB-86, MB-6	Concrete	2
T-84	MJB-64[illegible]	Concrete	2
T-85	MJB-64[illegible]	Concrete	2
T-86	MJB-64[illegible]	Concrete	2
T-41	MB-86, MB-6	Concrete	2
T-45	MB-86, MB-6	Steel	2
T-75	MB-86, MB-6	Steel	2
T-71	MB-6, MB-86	Steel	2
T-76	MJB-64	Steel	2
T-44	MB-6	Concrete	2

T-43, T-45 and T-75 also approved for horizontal installation. Maximum pipe size, 3½ in.

Ramset Fastening System Winchester-Western Division Mathieson Chemical Corp 289 Winchester Av New Haven Conn
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
3439	1111, 1107, 1125	Concrete, Steel	1
3412	1111, 1114, 1116	Concrete	1
3411	1111, 1114, 1116	Steel	1
3414	1111, 1114, 1116	Steel	1
3516	1107	Concrete	1
3517	1107	Concrete	1
3518	1107	Steel	1
3438	1111, 1107, 1125	Concrete	1
3437	1111, 1107, 1125	Concrete	1
3440	1111, 1107, 1125	Concrete, Steel	1
3439	1111, 1107, 1125	Steel	1
3441	1111, 1107, 1125	Steel	1

3439 and 3440 also approved for horizontal installation. Maximum pipe size, 3½ in.

Remington Arms Co Inc Bridgeport Conn
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
X-42	11C46	Concrete	1
X-43	11C46	Steel	1
N-83	8C-56, 9C-68	Concrete	1½
N-84	8C-56, 9C-68	Concrete	1½
N-82	8C-56, 9C-68	Steel	1½
N-04	8C-56, 9C-68	Steel	1½

N-84 and N-04 also approved for horizontal installation. Maximum pipe size, 3½ in.

Silspa Inc 1501 N Davidson St Charlotte 2 N C
The following are approved for vertical installation.

Fastener, Cat. No.	*Coupling, Cat. No.*	*For use in*	*Max. pipe size, in.*
A3880	936	Concrete	2
A381134	936	Concrete	2
A381812	936	Concrete	2
A3565	936	Concrete	2
A3390	937	Concrete	2
A1042	937	Concrete	2
AH1232	937	Steel	2

Coupling, Cat. No.	For use in	Max. pipe size, in.
642, 555, 559	Concrete	6
642, 555, 559	Concrete	6
642, 555, 559	Concrete	6
642, 555, 559	Concrete	6
642, 555, 559	Concrete	6
642, 555, 559	Steel	6
642, 555, 559	Steel	6
—	Concrete	1¼
643	Concrete	1¼
643	Concrete	1¼
643	Concrete	2
—	Steel	1¼
643	Steel	1¼
643	Steel	2
—	Concrete	2
556	Concrete	2
556	Concrete	2
556	Concrete	2
556	Steel	2

approved for horizontal installation. Maximum pipe size, 8¼ in.

ity Power Tool Co 201 No Braddock Av Pittsburgh 8 Pa
clusive distributor of explosive-driven fasteners for the Mine
y Appliances Company. See listing above.

PE COLLARS

Automatic sprinkler pipes passing through water-
d floors should be equipped with a sleeve or collar to
vent water leakage around pipe. This fitting is a
o-section flanged collar having a rubber-cloth insert
n and is bolted to the pipe and floor.

nnell Corp Providence R I
to 8 in.

RANCH-LINE TESTERS

Line testers are intended for permanent installation
branch lines of sprinkler systems between the last
d and sprinkler. Opening a side outlet allows
r to flow through the tester. Its purpose is to
plify and reduce the cost of testing and flushing
nkler-system branch lines.

g Manufacturing Inc 4461 W Jefferson Av Detroit 9 Mich
ch Line Tester. Model No. 445.

WATERFLOW ALARM VALVES

Waterflow alarm valves (alarm check valves) are
talled in either vertical or horizontal positions in wet-
pe sprinkler systems to sound a fire-alarm gong when a
w of water from the system equals or exceeds that of a
gle sprinkler. They are designed for use with hy-
aulic or electric gongs or both. There are two designs,
e differential type and the pilot valve type. The dif-
ferential type has a rubber faced clapper with an annular
groove in the seat; the pilot valve type has a metal faced
clapper with a pilot valve attached to the clapper arm.
These devices are equipped with a retard chamber to
prevent false alarms from surges and fluctuations in
water supply pressures.

For a general alarm throughout a plant yard, the ap-
proved water-motor gong is preferred.

Alarms are tested by flowing water through the
system's test pipe.

American District Telegraph Co 155 Sixth Av New York 13 N Y
No. D-497. No. D-497-X (explosionproof). To be used with a weighted or differential check valve. Available only with ADT supervisory service.

Waterflow Detector No. 6121. Consists of an excess pressure pump No. 6121-P, a control panel No. 6121-C, and a trim kit No. PA-22316. To be used with an alarm check valve against which excess pressure can be maintained without excessive pumping. The manufacturer should make tests to determine the suitability of the detector for each installation.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Model 153. 6, 8 in.

Central Automatic Sprinkler Co Inc Fourth St & Cannon Av Lansdale Pa
Lewis Model A. 2½, 3, 4, 6, 8 in.
Lewis Model D. 6, 8 in. For vertical position only.

Fire Protection Co 6601 S Narragansett Av Chicago 38 Ill
Model B. 6 in. For vertical position only.

Gamewell Company Newton Upper Falls 64 Mass
Waterflow Detector System. Consists of the following major items: excess-pressure pump assembly Cat. No. A-36615-1, low-pressure alarm switch Cat. No. RM43270A, low-pressure supervisory switch Cat. No. RM43270A, indicating panel Cat. No. M2011-14. To be used with an alarm-check valve against which excess pressure can be maintained without excessive pumping. The manufacturer should make tests to determine the suitability of the system for each installation.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Globe Model E. 4, 6, 8 in.

Grinnell Corp Providence R I
Grinnell Model A. 3, 4, 5, 6, 8 in.

Hodgman Mfg Co Taunton Mass
Hodgman Model B. 4, 6, 8 in.

Kaisler Corp 750 Third Av New York 17 N Y
Grimes Model B. 6, 8 in.
Grimes Model B-1. 4 in.

Reliable Automatic Sprinkler Co Inc 525 N MacQuesten Pky Mt Vernon N Y
Reliable Model B. 4, 6, 8 in.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Model F. Sprinklarm. 4, 5, 6, 8 in. To be used with Rockwood alarm valve Model F. A part of the Gamewell Sprinkler Watchman.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Star Model B. 4, 6, 8 in.

Viking Corp Hastings Mich
Model E. 4, 6, 8 in.

WATERFLOW ALARM INDICATORS

Flow indicators installed in sprinkler system risers provide an electrical alarm only when a flow of water from the system equals or exceeds that of a single sprinkler. They can be used with either open or closed circuits.

They consist of a flexible vane which projects into the waterway. Water movement deflects the vane and the motion is transmitted to an alarm-actuating switch

after a predetermined time delay. The time delay is accomplished by the use of an instantly recycling retard.

Waterflow indicators equipped with accumulative-type thermal retards or no retards are no longer approved since field experience has shown them to be unsatisfactory primarily due to false alarm troubles.

Flow indicators should not be specified for those systems where the time duration of a pressure fluctuation is greater than the retard time. Instantly recycling retards will not transmit an electrical alarm until the time duration of the pressure fluctuation or waterflow past the vane of the flow indicator has exceeded the pre-determined time setting of 30-60 seconds.

Factory Mutual approved waterflow indicators with either no retard or a thermal type retard need not be replaced unless giving trouble from false alarms.

American District Telegraph Co 155 Sixth Av New York 13 N Y
Model D-496. Model C-498-X (explosionproof). 2½ to 8 in. 8 to 115v a-c or d-c. 8 watts. Used with any approved recycling retard and/or transmitter.
No. B6123. 2½ to 8 in. Pneumatic retard and transmitter.
No. B6124. 2½ to 8 in. Pneumatic retard. Used with approved Type 1101 transmitter.

Atmo Automatic Fire Alarm Systems Kidde Ultrasonic & Detection Alarms Inc Brighton Rd Clifton N J
Models KVSR, KVTR. No. 04610001 or higher. 2 to 8 in. a-c or d-c. Pneumatic retard.
Model KVS. No. 04610001 or higher. 2 to 8 in. Used with any approved transmitter employing instantly recycling retard.

Autocall Co Shelby O
Type WF3. 3 to 8 in. 115v a-c. Electric retard, 90 sec maximum.
Type WF4. 3 to 8 in. 115v a-c. Pneumatic retard, 120 sec maximum.

Central Station Signals Inc 53 West Twenty-third St New York N Y
Models PR8-1, PRT-1. 2½ to 8 in. a-c or d-c. Pneumatic retard.

Fire Lite Alarms Inc 190 Fulton Terrace New Haven 2 Conn
Models VSR, VTR. No. 04610001 or higher. 2 to 8 in. a-c or d-c. Pneumatic retard.
Model VS. No. 04610001 or higher. 2 to 8 in. Used with any approved transmitter employing instantly recycling retard.

Grinnell Corp Providence R I
Model D-1. ¾ to 8 in. Pneumatic retard adjustable 5 sec to 2 min. Switch rating 10 amp at 115/230v a-c or 0.10 amp at 250v d-c.
Model E-1. 2½ to 8 in. Pneumatic retard adjustable 5 sec to 2 min. Switch rating 10 amp at 115/230v a-c or 0.10 amp at 250v d-c.

Howe Electric Co 53 W Jackson Blvd Chicago Ill
Model E-1. 2½ to 8 in. Used with Howe Model B recycling retard relay, 20-30v a-c, electric retard, 50 sec maximum.
Models E-2, E-3, E-4. 2½ to 8 in. Used with pneumatic retard. Micro-switch ratings 15 amp at 125 to 250 or 460v a-c, ½ amp at 125v d-c, or ¼ amp at 250v d-c.

Notifier Corp 230 South 11th St Lincoln 8 Neb
Models NV-R, NV-RT. 2 to 8 in. a-c or d-c. Pneumatic retard.
Models NV, NV-T. 2 to 8 in. Used with any approved transmitter employing instantly recycling retard.

Potter Electric Signal Co St. Louis 1 Mo
Models VSR, VTR. No. 04610001 or higher. 2 to 8 in. or d-c. Pneumatic retard.
Model VS. No. 04610001 or higher. 2 to 8 in. Used with approved transmitter employing instantly recycling retard.

WATERFLOW ALARM SWITCHES

Waterflow alarm switches are pressure actuated designed to operate a local electrical alarm. They be used with waterflow alarm valves, dry-pipe va or automatic water-control valves in special sprin systems. See also Electric Signaling Equipment.

"Automatic" Sprinkler Corp of America Youngstown O
Model 86. 10 amp at 110v a-c. 5 amp at 220v a-c.

Central Automatic Sprinkler Co Inc Fourth St & Cannon Lansdale Pa
Model D. 15 amp at 115v a-c. 4.6 amp at 115v d-c. 6.5 at 230v a-c. 2.3 amp at 230v d-c.
Model E. 15 amp at 120/240v a-c.

Gamewell Company Newton Upper Falls Mass
Cat. No. RM-4746. 2.5 amp at 230v a-c.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Box 730 Newark 1 N J
Model C. 15 amp at 110v a-c. 10 amp at 230v a-c. 0.5 amp at 115v d-c.
Model G. 15 amp at 120/240v a-c.

Grinnell Corp Providence R I
Model B-1. 10 amp at 115-230v a-c. 10 amp at 12v 0.1 amp at 250v d-c.

Hodgman Mfg Co Taunton Mass
Model 50. 10 amp at 125-230v a-c, 12v d-c.

Rainier Corp 750 Third Av New York 17 N Y
Model A. 15 amp at 110v a-c. 0.5 amp at 115v d-c.

Reliable Automatic Sprinkler Co Inc 525 N MacQuesten Mt Vernon N Y
Model G, Type 1. 15 amp at 120/240v a-c.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Model C. 2.5 amp at 230v a-c.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Model C. 20/40 amp at 220/110v a-c. 0.25/0.5 amp at 230/115v d-c.

United Electric Controls Co 85 School St Watertown 72 Mass
Type J7X, Model 5355. 15 amp at 120/240v a-c.

Viking Corp Hastings Mich
Class No. 9018. Type ASG682. 5 amp at 230v a-c. 10 at 25v a-c.

DRY-PIPE VALVES

In buildings where it is impractical to keep temperatures above freezing, automatic sprinkler systems should be equipped with an approved dry-pipe valve. The sprinkler piping contains air under pressure, instead of water. When a sprinkler operates, air escapes, the dry-pipe valve trips, and water is admitted automatically to the system which then functions as a regular wet system.

Dry-pipe valves are designed so that a moderate amount of air pressure will hold back a much greater

...er pressure. In the *differential type*, the air pressure ...s the water clapper closed either by means of a ...ference in areas on which the water and air pressures ..., or by a combination of this principle with a lever ...ion. In the *mechanical type*, a clapper on the water ...t is held closed by a system of levers which are con... by a relatively small air clapper.

A suitable alarm is connected to the dry-pipe valve ...that a warning is given when the valve operates. ...is may be a mechanical alarm that operates by a ...gle motor, or a hydraulic pressure switch that ...es an electric circuit to operate a bell or horn or ...

...matic" Sprinkler Corp of America Youngstown O
"Automatic" Model 30. 6 in.
"Automatic" Model 141. 6 in. With Model 141-700 float-drain ...ment.

...ntral Automatic Sprinkler Co Inc Fourth St & Cannon Av ...nsdale Pa
Model C. 3, 4, 6 in.

...e Protection Company 6601 S Narragansett Av Chicago 38 Ill
Model B. 6 in.

...be Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 ...x 750 Newark 1 N J
Model F. 4, 6 in.

...nnell Corp Providence R I
Cold-weather Valve. Model A. 2 in.
Grinnell Model E-2. 4, 6 in.

...nnell Co of Canada Ltd 2440 Dundas St NW Toronto Ont
Grinnell Model E-2. 4, 6 in.

...gman Mfg Co Taunton Mass
Fairman Model C. 3, 4, 6 in.

...ler Corp 750 Third Av New York 17 N Y
Rainier Model B. 6 in.

...able Automatic Sprinkler Co Inc 525 N MacQuesten Pky ...t Vernon N Y
Reliable Model C-1. 4, 6 in.

...kwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Model C. 4, 6, 8 in.
Rockwood Model D. 3, 3½ in.

...r Sprinkler Corp Westmoreland & Collins Sts Philadel...hia Pa
Star Model C. 4, 6 in.
Star Model D. 3 in.

...ing Corp Hastings Mich
Tyden Model C-2. 3, 4, 6, 8 in.

ACCELERATORS AND EXHAUSTERS

An accelerator or exhauster is a device which can be attached to a dry-pipe valve and cause it to trip very quickly after a sprinkler opens, thus making a dry-pipe system approach a wet system in time for effective operation.

These devices operate when system air pressure is reduced in excess of a predetermined rate, and the pressures in chambers connected by small orifices become unbalanced. Diaphragms moved by these unbalanced pressures open valves at outlet to increase rate of drop in system pressure or destroy differentials in dry-pipe valves.

Because they decrease the time for tripping dry-pipe valves, the size of a dry-pipe system equipped with such a device can be increased from the usual maximum of 500 gal to 750 gal air capacity.

Facings and diaphragms for renewal should be obtained from the manufacturer.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Exhauster. Model B.
"Automatic" Accelerator. Model 1.

Central Automatic Sprinkler Co Inc Fourth St & Cannon Av Lansdale Pa
Central Exhauster. Lewis Model A.
Central Accelerator. Lewis Model AD. For use with Model C dry valve only.

Fire Protection Company 6601 S Narragansett Av Chicago 38 Ill
Accelerator. Model B.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Globe Exhauster. Model B.
Globe Accelerator. Model C. For use with Model F dry valve only.

Grinnell Corp Providence R I
Grinnell Accelerator. Model A-6.

Grinnell Co of Canada Ltd 2440 Dundas St NW Toronto Ont
Grinnell Accelerator. Model A-6.

Rainier Corp 750 Third Av New York 17 N Y
Super-Accelerator. Model AB.

Reliable Automatic Sprinkler Co Inc 525 N MacQuesten Pky Mt Vernon N Y
Reliable Accelerator. Model A. Serial No. 4000 and higher.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Rockwood Exhauster. Model C.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Star Exhauster. Model BB.

Viking Corp Hastings Mich
Tyden Accelerator. Model B.
Tyden Supervised Rate-of-rise Releasing System, used to accelerate a dry valve.

AIR-PRESSURE MAINTENANCE DEVICE

To maintain automatically predetermined air pressure in conjunction with a continuous or automatic air supply, as in dry-pipe sprinkler systems.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Model A.

Viking Corp Hastings Mich
Tyden Model C.

DELUGE SPRINKLER SYSTEMS

Supervised deluge systems are approved as complete systems when engineered and installed by the manufacturer or licensees acceptable to Factory Mutual Engineering Division. Detailed layouts should be sub-

mitted to the insurance company for approval prior to awarding contracts.

The supervised rate-of-rise deluge system has open sprinklers and is used where it is desirable to deliver water through all sprinklers simultaneously and wet down the entire area protected, as at airplane hangars, pyroxylin storage or working, and similar special hazards needing the immediate application of large quantities of water.

There are three types of systems. In one type ("Automatic" Sprinkler Corp., Grinnell Co., Rockwood Sprinkler Co.), the water supply is held back from the sprinkler piping by a deluge valve, which is actuated by a thermal system of hollow copper bulbs called Heat-Actuated Devices (H.A.D.'s), connected by small copper air tubing. The thermal system contains air at low pressure (1½ lb.) automatically maintained. A trouble siren sounds if the supervisory air pressure in the thermal system falls below the specified amount. Increases in temperature from a fire cause increases in air pressure in the thermal system which is adjusted by the manufacturer to trip the deluge valve, usually when the temperature rises at a rate approximately equal to or greater than 20° per minute.

In another type (Viking Corp.), the water supply is held back from the sprinkler piping by a Tyden control valve which is actuated by a releasing system of thermostatic releases connected through small copper air tubing to an automatic air compressor and a diaphragm valve. A sudden rise of room temperature causes one or more thermostatic releases to vent the air pressure in the tubing and on the diaphragm valve. Loss of air pressure above the diaphragm valve causes the Tyden control valve to discharge water into the empty (deluge) sprinkler piping. The tubing contains air at low pressure automatically maintained. A trouble alarm sounds if air pressure in tubing is not properly maintained.

In a third type (Star Sprinkler Corp. and Central Automatic Sprinkler Co.), the water supply is held back from the sprinkler piping by a deluge valve, which is electrically actuated by the operation of thermostats. The electrical supply is from the 115 volt power lines and in case of failure of this source an automatic relay transfers operation to a stand-by storage battery under constant trickle charge. The detector circuit is of the closed circuit double-loop type so arranged that a single break will not render this system inoperative. The detector circuit may be re-arranged by a manual double-throw key switch into two open circuits each energised up to the point where the break exists, thereby providing protection until repairs can be made. The valve is normally tripped when a rate-of-rise thermostat operates, causing the operating relay to be energised. The armature of this relay then closes contacts which energize the duplex solenoid system causing the solenoid plungers to engage and release the clapper-retaining lever system. The detector system also includes a fixed temperature contact to [illegible] operation in fires which develop slowly.

"Automatic" Sprinkler Corp of America Youngstown
Suprotex Deluge System.

Central Automatic Sprinkler Co Inc Fourth St and [illegible]
Lansdale Pa
Central Electro-Speed Deluge System. Serial No. [illegible]

Grinnell Corp Providence R I
Multitrol Deluge System.
Multimatic Deluge System.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Dualguard Deluge System.

Star Sprinkler Corp Westmoreland and Collins Sts Philadelphia 34 Pa
Star Electromatic Deluge System.

Viking Corp Hastings Mich
Empty-pipe Sprinkler System.

PREACTION SPRINKLER SYSTEMS

Supervised preaction systems are approved as [illegible] plete systems when engineered and installed by [illegible] manufacturer or licensees acceptable to Factory Mutual Engineering Division. Detailed layouts should be submitted to the insurance company for approval prior to awarding contracts.

The supervised rate-of-rise preaction system [illegible] closed sprinklers with spacings and pipe sizes of standard wet- or dry-pipe system.

The preaction system may be used wherever a wet- or dry-pipe system is applicable and where it is desirable to have a dry-pipe system comparable in speed to a wet-pipe system, an alarm in advance of sprinkler operation, a system free from risk of freezing, or to minimize water damage due to premature operation or [illegible] injury.

Supervisory air pressure is maintained in the system piping. A trouble alarm sounds if the supervisory air pressure in the sprinkler piping is not properly maintained, but the water control valve does not operate.

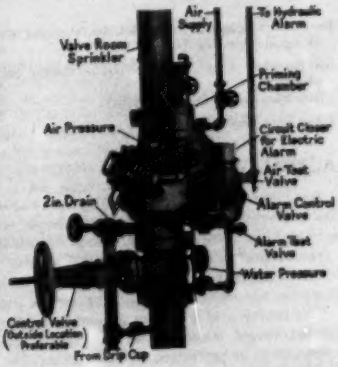
The water control valve is operated by an independent fire-detecting system consisting of either mechanically or electrically operated fire detectors. When temperatures rise in excess of a predetermined rate, the fire detectors operate to open the water control valve and admit water to the piping ready to discharge through sprinklers when the fusible element operates.

The fire-detecting systems and the water control valves of the several manufacturers are either identical or similar to those of the supervised rate-of-rise deluge systems of the respective manufacturers.

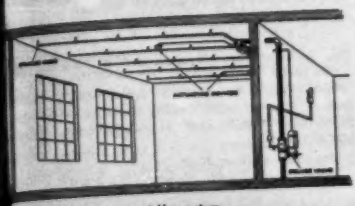
"Automatic" Sprinkler Corp of America Youngstown O
Suprotex Sprinkler System.

Grinnell Corp Providence R I
Multitrol Sprinkler System.

Automatic water-control valves, deluge sprinkler system.



Dry-pipe valve.



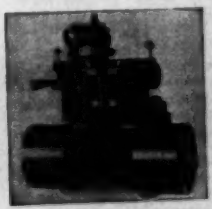
Deluge sprinkler system.

Air-pressure maintenance device.

Accelerator on dry-pipe valve.

Waterflow alarm valve.

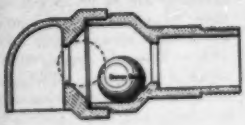
Waterflow alarm switch.



Waterflow alarm indicator.

Pressure gage.

Automatic release.



Ball drip.

Flexible coupling.

Fire-department connection.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Dualguard Sprinkler System.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Star Electromatic Preaction System.

Viking Corp Hastings Mich

AUTOMATIC RELEASES

Approved releases are used to operate automatically fire protection equipment such as alarms, automatic sprinkler and deluge systems, carbon dioxide and foam systems, fire doors, ventilating and blower systems, hatches, dip tank covers and drain valves, motor stops, dampers, and valves controlling hazardous liquids.

The function of a release system is to drop a suspended weight which causes the desired mechanical operation to be performed in case of fire. The releases listed are operated by fixed-temperature or by rate-of-rise thermostats, electrical or mechanical as described. Means for manual operation should also be provided.

"Automatic" Sprinkler Corp of America Youngstown O
Mechanical Control Release. 80-100 (maximum load 50 lb). 50-100-1 (minimum load 50 lb, maximum 300 lb). A mechanical control release system consists of one or more heat-responsive rate-of-rise thermostats connected to a release by air tubing in which there is a vent to compensate for normal temperature variations. The release is usually operated by an air-filled metal bulb which acts as a heat detector. An abnormal rate-of-rise of temperature, as from fire, causes the air in the bulb to expand, creating pressure which is transmitted through a small copper tube and acts on a diaphragm in such a way that a system of levers unlocks an arm that supports a weight. The dropping of the weight then operates the protective equipment. The release may be equipped with a manual trip. It may also be operated by a remote-control station or a hydropneumatic control 41-100 connected to the alarm line of a sprinkler valve.

Derby Devices Inc 118 Quinnipiac Av North Haven Conn
Derby Electric Release. Open or closed circuit. An electric tripping mechanism used for releasing a suspended weight when a supervisory circuit is energized. The release is operated by manual break-glass boxes, or by fixed-temperature or rate-of-rise thermostats. An energized electromagnet moves its armature to release a lever system and free the weight-supporting arm. The release may be used in series with other devices on 240v or less, a-c or d-c. Maximum load on weight hook 50 lb. Wiring circuit should be in accordance with manufacturer's directions. Where the release is installed on a closed circuit, the supervisory current should not exceed 50 milliamperes.

Viking Corp Hastings Mich
Viking Supervised Releasing System. Consists of a Tyden B thermostatic release connected by ⅛-in. copper tubing to a diaphragm release. An air compressor automatically maintains air pressure in the release system. Operation of the thermostatic release by heat from a fire opens a small Schrader valve which permits air pressure to escape, and this in turn operates a drop-weight diaphragm release, diaphragm valve, or control valve.

Viking Release. Model A-5. Designed primarily for use in wet-pipe pilot-line operation on Viking rate-of-rise deluge systems. May also be used as a substitute for the Model B release in dry-pipe pilot-line operation on Viking supervised rate-of-rise deluge and preaction systems.

WATER-CONTROL VALVES, Automatic

The following automatic-opening valves are approved for controlling the flow of water to special extinguishing systems of sprinklers, spray nozzles, or mechanical foam making equipment, when supervised as required for supervised deluge or preaction systems.

"Automatic" Sprinkler Corp of America Youngstown O
"Automatic" Deluge Valve. Model C. 2½, 6 in.
"Automatic" Deluge Valve. Model 134-220. 2 in.
"Automatic" Deluge Valve. Model 142. 8 in.
"Automatic" Deluge Valve. Model 134-300. 3 in.

Central Automatic Sprinkler Co Inc Fourth St and Conner Lansdale Pa
Central Deluge Valve. Model AD. 3, 4, 6 in. With 115v and 40v d-c operating coils.

Grinnell Corp Providence R I
Grinnell Thermal Control Valves. Model B (1 in.). Model (1¼ in.).
Grinnell Flooding Valves. Model B (2 in.) Model A-3 (3 in. Model A-1 dry-pilot line actuator may be used with these valves.
Grinnell Multimatic Valve. Model A-2. 6 in. Model A-1 dry-pilot line actuator may be used with this valve.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Model K-2. 2 in.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Star Deluge Valve. Model D. 3, 6 in. With 20v d-c operating coils. When used in public-utility generating-station applications these valves may be equipped with either 48v, 125v,* or 250v operating coils.

Viking Corp Hastings Mich
Tyden Control Valve. Model D. 2, 3, 4, 6 in.

PRESSURE GAGES

Gages for sprinkler systems and fire pumps are designed for use with air, steam or water. These gages are of the Bourdon type having an enclosed phosphor-bronze tube. The moving parts are brass except the hair spring which is phosphor-bronze. The case and ring are brass. The ring is either threaded or pressed over the case and secured by two small round head screws. The glass is secured to the ring.

When installed on the air side of a dry-pipe system a retard-type gage may be used. This gage is assembled with an 80-lb tube and is provided with a retard spring to resist the full scale load.

Two sizes are available, 4½ or 3½ in. diameter. Markings are 80 psi in 1-lb increments in the retard type and in 5 psi increments to the full scale reading for the straight pressure type. The gages can be tested with a hydraulic testing unit and the dial pointer adjusted accordingly. Pressure tests require the gage to be correct within one per cent of the manufacturer's specified pressure over the working range.

For service on fire pumps where suction may be taken under a lift, compound pressure and vacuum gages are available. These gages are graduated in pounds per square inch on both the pressure and vac

...gales, and are designed not to be injured by ...ssure.

To minimize possible damage from momentary high ...ssure, the specified pressure, when possible, should be ...least twice the maximum working pressure.

...e Gauge and Instrument Co Inc 30 Main St Brooklyn 1 N Y
Water Pressure Pump Gages. 0-250 lb. 4½ in.
Water Compound Pump Gages. 15 psi vacuum to 300 lb. 4½ in.

...ve Valve Co 43 Kendrick St Wrentham Mass

...K. Lonergan Co Second & Race Sts Philadelphia 6 Pa

...ch Instrument Co Div of Colorado Oil & Gas Corp 1001 Howard Av Skokie Ill

...ard Steam Gauge Div of American Machine & Metals Inc Jeannette Pa
Water Pressure Gages. Nos. 1890-S 0-250 P.., 3½ in.), ...-Off Retard (0-80-250 lb, 3½ in.).

...TSIDE-SCREW GATE VALVES

Outside-screw-and-yoke valves are recommended for ...vice indoors and in pits outdoors. The stem indicates ...a glance whether or not the valve is open. Smaller ...es, ¾ to 2 in. inclusive, are of bronze. Larger sizes, ...¼ to 14 in. inclusive, are of iron, bronze mounted. ...e manufacturer makes valves of bronze up through ...2-in. size.

Tapping valves with their associated sleeves are ...igned to permit repairs to existing sprinkler systems ...thout having to shut off the water supply. One end ...the valve is flanged for attachment to the sleeve. ...e other end has special adapters for the tapping ...chine.

...ous Valve Mfg Co 22 Bayview Av Manhasset L I N Y
Fig. 27. 2½ to 10 in. Screwed.
Fig. 27. 2½ to 12 in. Flanged.

...ards Valve & Hydrant Co Ltd Brantford Ont
No. 2. 4, 6 in. Screwed.
No. 12. 4 to 12 in. Flanged.
No. 13. 4 to 12 in. Hub.
No. 15. 4 to 12 in. Stand. mech. joint.
No. 16F. 4 to 12 in. Fluid-Tite.
No. 16R. 4 to 12 in. Ring-Tite.
Tapping Valves. No. 56. 4 to 14 in. Hub.
Tapping Valves. No. 56Z. 4 to 14 in. Flanged.
Tapping Valves. No. 56S. 4 to 14 in. Stand. mech. joint.

...ons Co 4180 S Kedzie Av Chicago Ill
No. 668. ¾ to 2 in.
No. 667. 2½ to 12 in. Flanged.

...ons Canada Limited Montreal P Q
No. 667. 2½ to 12 in. Flanged.
No. 667½. 2½ to 4 in. Screwed.

...ing Valve & Mfg Co Williamsport Pa
No. B-41, B-42. 1 to 3 in.
No. 80 FM. 4 to 14 in.
Tapping Valves. No. 56 FM. 2 to 12 in. Hub.
Tapping Valves. No. 56Z. 2 to 12 in. Flanged.

...dy Valve Co Waterford N Y
Fig. F-3848. 4 to 14 in. Flanged.

Fairbanks Co Binghamton N Y
Fig. 0204. ¾ to 2 in. Flanged.
Fig. 0222. ¾ to 2 in. Screwed.
Fig. 0411. 2½ to 6 in. Screwed.
Fig. 0412. 2½ to 14 in. Flanged.
Fig. 0413. 2½ to 14 in. Hub.

Fittings Limited Oshawa Ont
Fig. 505. 2½ to 8 in. Screwed.
Fig. 508. 2½ to 10 in. Flanged.

Jenkins Bros Bridgeport Conn
Fig. 275-U. ¾ to 2 in.
Fig. 824-A. 2½ to 4 in. Screwed.
Fig. 825-A. 2½ to 12 in. Flanged.

Jenkins Bros Ltd 150 St Joseph St Lachine P Q
Fig. 305-U. ¾ to 2 in.
Fig. 824. 2½ to 8 in. Screwed.
Fig. 825. 2½ to 12 in. Flanged.

Kennedy Valve Mfg Co Elmira N Y
Fig. 60. ¾ to 2 in.
Fig. 67. 2½ to 6 in. Screwed.
Fig. 68. 2½ to 14 in. Flanged.
Fig. 681. 4 to 14 in. Hub.

Ludlow Valve Mfg Co Inc Troy N Y
List 44. 4 to 12 in. Hub.
List 44. 2½ to 12 in. Flanged.
List 44. 4 to 12 in. Stand. mech. joint.
List 44. 2½ to 3½ in. Screwed.

M & H Valve & Fittings Co Box 151 Anniston Ala
Fig. 81-F. 2½ to 14 in. Flanged.
Fig. 81-S. 2½ to 8 in. Screwed.
Fig. 81-H. 3 to 14 in. Hub.
Fig. 81-FT. 4 to 14 in. Fluid-Tite.
Fig. 81-RT. 4 to 14 in. Ring-Tite.
Fig. 81-HF. 4 to 14 in. Flanged. Hub.
Fig. 81-MF. 4 to 14 in. Flanged. Mech. joint.

T. McAvity & Sons Ltd St John N B
Fig. 10259. 2½ to 6 in. Screwed.
Fig. 10269. 2½ to 14 in. Flanged.
Fig. 10267. 4 to 14 in. Hub.
Fig. 10265. 4 to 14 in. Standardized mechanical joint.
Fig. 10268. 4 to 14 in. Ring-Tite.
Fig. 10262. 4 to 12 in. Fluid-Tite.

Mueller Co 2501 Chestnut St Chattanooga Tenn
Fig. A-2073-5. 4 to 14 in. Hub.
Fig. A-2073-6. 4 to 14 in. Flanged.
Fig. A-2073-8. 2½ to 8 in. Screwed.
Fig. A-2073-20. 4 to 14 in. Standardized mechanical joint.
Fig. A-2073-24. 4 to 12 in. Ring-Tite.
Fig. A-2073-34. 4 to 12 in. Fluid-Tite.

Ohio Injector Co Wadsworth O
Figs. 243½, 244½. ¾ to 2 in.
Fig. 1153. 2½ to 6 in. Screwed.
Fig. 1154. 2½ to 14 in. Flanged.

Wm Powell Co Cincinnati O
Fig. 1153. ¾ to 2 in.

R-P&C Valve Division American Chain & Cable Co Inc Reading Pa
Fig. 95. ¾ to 2 in.
Fig. 124. 2½ to 6 in. Screwed.
Fig. 125. 2½ to 12 in. Flanged

Stockham Valves & Fittings 4000 10th Ave N Birmingham Ala
No. B-133. ¾ to 2 in.
No. G-633. 2½ to 6 in. Screwed.
No. G-634. 2½ to 12 in. Flanged.

No. G-637. 4 to 14 in. Hub.
No. G-636. 4 to 14 in. Standardized mechanical joint.

Traverse City Iron Works Traverse City Mich
No. A-266. 2½ to 12 in. Flanged.
No. A-267. 2½ to 12 in. Hub.
No. A-268. 2½ to 12 in. Standardized mechanical joint.
No. A-267-RT. 2½ to 12 in. Ring-Tite.
No. A-267-FT. 2½ to 12 in. Fluid-Tite.

Walworth Co Inc South Braintree Mass
No. 873. ¾ to 2 in.

INSIDE-SCREW GATE VALVES

Inside-screw gate valves are for underground use, except in pits. When equipped with either "Ring-Tite" or "Fluid-Tite" connections, they are acceptable if anchored in accordance with Factory Mutual specifications.

In all new fire-protection system installations, buried valves must open in a counterclockwise direction regardless of the direction-to-open of the valves of the public water system. An exception to this will be when *all* other buried valves in a plant yard open in a clockwise direction in which case all new valves should also open in that direction.

When some buried valves in a system open one way and some the other, all new valves should open counterclockwise. There may be exceptions to this where the great majority of valves in an extensive yard system open clockwise. In such cases, the Factory Mutual Engineering Division should be consulted regarding the proper direction-of-opening.

Canada Valve & Hydrant Co Ltd Brantford Ont
No. 51. 4, 6 in. Screwed.
No. 52. 4 to 12 in. Flanged.
No. 53. 4 to 12 in. Hub.
No. 55. 4 to 12 in. Standardized mechanical joint.
No. 50R. 4 to 12 in. Ring-Tite.
No. 50F. 4 to 12 in. Fluid-Tite.
Tapping Valves. No. 56. 4 to 14 in. Hub.
Tapping Valves. No. 56S. 4 to 14 in. Stand. mech. joint.

Crane Co 4100 S Kedzie Av Chicago Ill
Fig. 462½. 4 to 10 in.

Darling Valve & Mfg Co Williamsport Pa
Fig. 52. 4 to 14 in. Flanged.
Fig. 53. 4 to 14 in. Hub.
Fig. 55. 4 to 14 in. Standardized mechanical joint.
Fig. 50R. 4 to 12 in. Ring-Tite.
Fig. 50F. 4 to 12 in. Fluid-Tite.
Tapping Valves. Fig. 56. 4 to 12 in. Hub.
Tapping Valves. Fig. 56MJ. 4 to 12 in. Stand. mech. joint.

Eddy Valve Co Waterford N Y
Fig. F-2842. 4 to 14 in. Hub.
Fig. F-2844. 4 to 14 in. Standardized mechanical joint.
Fig. F-2846. 4 to 14 in. Flanged, with operating nut instead of handwheel.

Fairbanks Co Binghamton N Y
Fig. 0431. 4 to 14 in. Hub.
Fig. 0432. 4 to 12 in. Screwed.
Fig. 0433. 4 to 14 in. Flanged.
Fig. 0434. 4 to 14 in. Hub.

Fittings Limited Oshawa Ont
Fig. 513. 4 to 10 in. Hub.
Fig. 514. 4 to 10 in. Flanged.
Fig. 549. 4 to 10 in. Standardized mechanical joint.

Jenkins Bros Bridgeport Conn
Fig. 822. 4 to 10 in. Hub.

Jenkins Bros Ltd 130 St. Joseph St Lachine P Q
Fig. 821. 4 to 14 in. Flanged.
Fig. 822. 4 to 14 in. Hub.
Fig. 306. 4 to 14 in. Standardized mechanical joint.

Kennedy Valve Mfg Co Elmira N Y
Fig. 70. 4 to 14 in. Hub.
Fig. 701. 4 to 14 in. Flanged.
Fig. 702. 4 to 14 in. Screwed.
Fig. 71. 4 to 14 in. Standardized mechanical joint.

Ludlow Valve Mfg Co Troy N Y
List 44. 4 to 12 in. Flanged.
List 4 FM. 4 to 12 in. Hub.
List 4 FM. 4 to 12 in. Standardized mechanical joint.

M & H Valve & Fittings Co Anniston Ala
Fig. 82-H. 4 to 14 in. Hub.
Fig. 82-S. 4, 6 in. Screwed.
Fig. 82-F. 4 to 14 in. Flanged.
Fig. 82-M. 4 to 14 in. Standardized mechanical joint.
Fig. 82-RT. 4 to 14 in. Ring-Tite.
Fig. 82-FT. 4 to 12 in. Fluid-Tite.
Tapping Valves. No. 75-P. 4 to 12 in. Hub.
Tapping Valves. No. 75-PM. 4 to 14 in. Standardized mechanical joint.

T McAvity & Sons Ltd St John N B
Fig. 61667. 4 to 14 in. Hub.
Fig. 61668. 4 to 14 in. Flanged.
Fig. 61675. 4 to 14 in. Standardized mechanical joint.
Fig. 61676. 4 to 14 in. Ring-Tite.
Fig. 61679. 4 to 14 in. Fluid-Tite.

Mueller Co 2301 Chestnut St Chattanooga Tenn
Fig. A-2072-5. 4 to 14 in. Hub.
Fig. A-2072-6. 4 to 14 in. Flanged.
Fig. A-2072-20. 4 to 14 in. Standardized mechanical joint.
Fig. A-2070-5. 4 to 8 in. Hub. For wall indicator posts only.
Fig. A-2070-6. 4 to 8 in. Flanged. For wall indicator posts only.
Fig. A-2072-24. 4 to 12 in. Ring-Tite.
Fig. A-2072-34. 4 to 12 in. Fluid-Tite.
Tapping Valves. No. H-660. 4 to 14 in. Hub.
Tapping Valves. No. H-665. 4 to 14 in. Standardized mechanical joint.

Ohio Injector Co Wadsworth O
Fig. 1155. 4 to 14 in. Hub.
Fig. 1156. 4 to 14 in. Flanged.

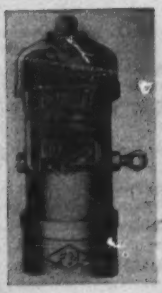
R-P&C Valve Division American Chain & Cable Co Inc Reading Pa
Fig. 126. 4 to 12 in. Hub.

Stockham Valves & Fittings 4000 10th Av N Birmingham Ala
No. G-625. 4, 6 in. Screwed.
No. G-631. 4 to 14 in. Hub.
No. G-632. 4 to 12 in. Flanged.
No. G-635. 4 to 14 in. Standardized mechanical joint.

Traverse City Iron Works Traverse City Mich
Fig. A-260. 4 to 12 in. Hub.
Fig. A-261. 4 to 12 in. Standardized mechanical joint.
Fig. A-263. 4 to 12 in. Flanged.
Fig. A-257-RT. 4 to 12 in. Ring-Tite.
Fig. A-257-FT. 4 to 12 in. Fluid-Tite.

Clack valve.

Waterflow detector check valve.



Target mechanism of indicator post.

Indicator post.

Double check valves.

Fire-service meter.

Outside-screw gate valve.

Inside-screw gate valve.

Outside-screw gate valve.

DICATOR POSTS

Indicator posts are controls, extending aboveground, by means of which underground sprinkler valves may be operated. As an important feature of their design, a target or indicator, visible through an opening in the post, shows whether the valve is open or shut.

The indicator post consists of a cast-iron barrel, an extension flange which allows the height of the barrel to be regulated, and a wrought-iron or mild steel stem which operates the underground valve and simultaneously moves the target. A telescoping union permits turning the stem from a constant height.

Indicator posts are available for installation on existing gate valves.

In all new fire protection system installations, buried valves must open in a counterclockwise direction regardless of the direction-to-open of the valves of the public water system. An exception to this will be when *all* other buried valves in a plant yard open in a clockwise direction in which case all new valves should also open in that direction.

When some buried valves in a system open one way and some the other, all new valves should open counterclockwise. There may be exceptions to this where the great majority of valves in an extensive yard system open clockwise. In such cases, the Factory Mutual Engineering Division should be consulted regarding the proper direction-of-opening.

"Automatic" Sprinkler Corp of America Youngstown O
Cat. Fig. 541.

Canada Valve & Hydrant Co Ltd Brantford Ont
Cat. Fig. 1241.

Crane Co 4100 S Kedzie Av Chicago Ill
Cat. Fig. No. 510.

Darling Valve & Mfg Co Williamsport Pa
Cat. Fig. 1241.

Eddy Valve Co Waterford N Y
Cat. Figs. F-2530, F-2532.

Fairbanks Co Binghamton N Y
Cat. Fig. 0435.

Fittings Limited Oshawa Ont
Cat. Fig. 515.

Grinnell Corp Providence R I
Cat. Fig. 1430.
Cat. Fig. 1432 Indicator Post and Fig. 1446 or 1446-A Extension Yoke Assembly.
Cat. Figs. 1443, 1443S. Wall type.

Jenkins Bros Ltd 150 St Joseph St Lachine P Q
Cat. Fig. 345.

Kennedy Valve Mfg Co Elmira N Y
Cat. Fig. 541

Ludlow Valve Mfg Co Inc Troy N Y
Cat. Fig. 290. Rotating target.

M & H Valve & Fittings Co Anniston Ala
Cat. Fig. 53.
Cat. Fig. 53-W. Wall type.

T McAvity & Sons Ltd St John N B
Cat. Fig. 6221.

Mueller Co 2501 Chestnut St Chattanooga Tenn
Cat. Fig. A-20805. Non-adjustable type. One piece.
Cat. Fig. A-20800. Adjustable type. Two piece.
Cat. Fig. A-20810. Wall type. Any dimension.

R-P&C Valve Division American Chain & Cable Co Inc Reading Pa
Cat. Fig. 310.

Stockham Valves & Fittings Inc Birmingham Ala
Cat. Fig. G-051.

Traverse City Iron Works Traverse City Mich
Cat. Fig. A-240. Post and valve.

BALL VALVES

Manually operated ball valves are used to control water to small open-head extinguishing systems or in the trim on waterflow alarm valves, dry-pipe valves, or automatic water-control valves.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Fig. 801. 2 in. 300 psi.
Fig. 101. ¾ to 2 in. 300 psi.

CHECK VALVES

Approved iron-body check valves for fire-protective systems have a bronze swing check that is held closed by the back pressure but is free to swing when water is flowing. All working parts are of bronze and can readily be removed for inspection. Replacement facings should be obtained from the valve manufacturer for the specific size, type, and model of valve. These facings are made to exact specifications and substitutes should not be used.

Crane Co 4100 S Kedzie Av Chicago Ill
No. 375. 2½ to 10 in.

Darling Valve & Mfg Co Williamsport Pa
No. 51HC. 2 to 8 in. Screwed.
No. 52HC. 2 to 14 in. Flanged.
No. 53HC. 2 to 14 in. Hub.
No. 55HC. 2 to 14 in. Standardized mechanical joint.

Fairbanks Co Binghamton N Y
Figs. 0711, 0712. 4 to 12 in. Flanged.

Grinnell Corp Providence R I
Fig. 1305. Model A-2. 4 to 12 in. Flanged.

Jenkins Bros Bridgeport Conn
Figs. 627, 628, 629. 2½ to 10 in.
Fig. 727. 2½, 3 to 12 in. Hub. Rubber-faced.
Fig. 728. 2½, 3 to 12 in. Screwed. Rubber-faced.
Fig. 729. 2½, 3 to 12 in. Flanged. Rubber-faced.

Jenkins Bros Ltd 150 St Joseph St Lachine P Q
Figs. 477, 478, 479.

Kennedy Valve Mfg Co Elmira N Y
Fig. 126. 4 to 12 in. Flanged.
Fig. 126A. 4 to 12 in. Flanged. Rubber-faced.

Ludlow Valve Mfg Co Troy N Y
4 to 12 in. Furnished with or without rubber facings.

M & H Valve & Fittings Co Anniston Ala
No. 250-S. 2½ to 8 in. Screwed.
No. 250-SR. 2½ to 8 in. Screwed. Rubber-faced.
No. 250-F. 2½ to 14 in. Flanged.
No. 250-FR. 2½ to 14 in. Flanged. Rubber-faced.
No. 250-H. 4 to 14 in. Hub.
No. 250-HR. 4 to 14 in. Hub. Rubber-faced.
No. 250-M. 4 to 14 in. Standardized mechanical joint.
No. 250-MR. 4 to 14 in. Standardized mechanical joint. Rubber-faced.

T McAvity & Sons Ltd St John N B
4 to 12 in.

Mueller Co 2501 Chestnut St Chattanooga Tenn
Fig. A-2120-5. 3 to 14 in. Hub.
Fig. A-2120-6. 2½ to 14 in. Flanged.
Fig. A-2120-8. 2½ to 8 in. Screwed.
Fig. A-2122-5. 4 in. Hub. Rubber-faced.
Fig. A-2122-6. 4, 6, 8 in. Flanged. Rubber-faced.
Fig. A-2122-8. 4, 6 in. Screwed. Rubber-faced.

R-P&C Valve Division American Chain & Cable Co Inc Reading Pa
The following can be furnished with or without rubber facing.
Fig. 219. 2½ to 6 in. Screwed.
Fig. 220. 2½ to 12 in. Flanged.
Fig. 223. 3 to 12 in. Hub.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
4 in.

Stockham Valves & Fittings 4000 10th Av N Birmingham Ala
No. G-937. 2½ to 6 in. Screwed.
No. G-938. 2½, 4, 5, 6 in. Screwed.
No. G-939. 2½ to 12 in. Flanged.
No. G-940. 2½, 4 to 12 in. Flanged.

...ne City Iron Works Traverse City Mich
...following can be furnished with or without rubber facings.
...A-207. 2½ to 12 in. Flanged.
...A-208. 2½ to 12 in. Hub.

...ng Corp Hastings Mich
...del B. 4 in.
...del C. 6, 8 in.

...mith Co Inc 2133 Bond Av East St Louis Ill
...No. 8027. 2½, 4, 6, 8, 10 in. Flanged. With or without ...ber facings.

...ECK VALVES, Anti-water-hammer

...Fire-protective systems in high buildings sometimes ...perience severe water hammer caused by back flow ...m a pressure tank when the automatic control shuts ...wn the fire pump. These special check valves are ...ceptable for use in the discharge of a fire pump where ...ch flow may be expected to cause serious water ...mmer with the usual swing type valve, and *where the ...her high friction loss is not a serious objection.* The ...ves, which may be installed in either a horizontal or ...rtical position, have a spring-operated clapper, and ...ively light moving parts with a limited travel so ...t to obtain a closing action more rapid than the ...ormal flow in the pipe line.

...ckson Pump Valve Co 851 Preston St Philadelphia 4 Pa
...Style G. 4, 6, 8, 10 in.

...ve Valve Company Inc Box 1255 Pittsburgh Pa
...Model 103-FM. 4, 6, 8, 10 in.

...ton Valve & Pump Co Houston Tex
...ve-Chek. Fig. 15BMF Model A. 4, 6, 8, 10 in.

...ston Gauge Co Inc 2 Gateway Center Pittsburgh 22 Pa
...Viper. 4 to 12 in. Bronze-fitted.

...ECK VALVES, Special All-bronze

...These swing-type check valves with all parts, including ...e body, cover, and clapper assembly, made of bronze ...e specially designed for fire service connections between ...blic water supplies and non-potable water supplies. ...he valve is non-corrodible and will not tuberculate. ...There are large clearances between the body and mov...ng parts, and the clapper has a dome-shaped rubber ...cing which insures tightness at the seat. The valve is ...equipped with pressure gage and test drain.

...Two of these check valves with a 3 ft. to 5 ft. spacer ...e installed in series between gate valves and by ...eans of test facilities, tightness can be quickly verified. ...The installation is usually made in a suitably drained ...valve pit. This all-bronze double-check-valve installa...tion is required by the regulations of a number of state ...departments of health and is accepted by other states ...which have no cross connection regulations.

...Corbin Co Binghamton N Y
...Fig. 6712. 4, 8 in.

Grinnell Corp Providence R I
Uniflow. Fig. 1350. 6, 8, 10 in.

Jenkins Bros Bridgeport Conn
Fig. 843. 4, 6, 8, 10 in.

Jenkins Bros Ltd 150 St Joseph St Lachine P Q
Fig. 481. 4, 6, 8, 10 in. 2- and 3-in. valves are approved only on auxiliary supplies, other than fire-service connections.

FIRE-SERVICE METERS

Where local water works authorities require the installation of full registration metering devices on public water connections to private fire protection systems, meters especially designed for fire protection service should be used. Meters of this type have an unobstructed waterway and low friction loss at full capacity flow.

Hersey-Sparling Meter Co 230 Elm St Dedham Mass
Model FM. 3, 4, 6, 8, 10 in.

WATERFLOW DETECTOR CHECK VALVES

Where the water works authorities require metering devices on connections used only for fire service, there are instances where the indication of waterflow is considered of greater importance than knowing the actual amount of water used. When acceptable to the authorities, supervision of a fire service connection is best accomplished by means of an approved waterflow detector check valve.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J
Model A. 4, 6, 8 in.

Grinnell Corp Providence R I
Fig. 1369. Model A-2. 4, 6, 8 in.

Hersey-Sparling Meter Co 230 Elm St Dedham Mass
Model D C. 3, 4, 6, 8, 10 in.

Viking Corp Hastings Mich
Model C. 4, 6, 8 in.

FIRE-DEPARTMENT CONNECTIONS

A fire department connection, located outside where readily accessible, permits the fire department to pump water into a sprinkler system from a nearby public hydrant or reservoir. Water supplied at high pressure will aid automatic sprinklers to control a fire. The connection may also be used to supply building standpipes.

Approved connections are made of bronze and consist of two 2½-in. couplings threaded for standard fire hose and siamesed into a 4-in. pipe connection. A check valve is provided in each inlet so that either connection may be used separately. The connections are available in straight, 45° or 90° patterns.

W D Allen Mfg Co 650 S 25th Av Bellwood Ill
Fig. No. 221. Straight.
Fig. No. 31. 45°.
Fig. No. 230. 90°.

"Automatic" Sprinkler Corp of America Youngstown O
Straight, 90°.

M Greenberg's Sons 765 Folsom St San Francisco 7 Cal
Nos. 196, 196-A, 196-B. Straight, 45°, 90°.
No. 195. Flush-type.

Grinnell Corp Providence R I
Figs. 1682, 1683, 1684. Straight, 45°, 90°.

BALL DRIPS

Ball drips are designed to drain off automatically water which may leak past a closed gate valve into piping which must be kept free of water. Another common use is on fire department pumper connections. The ball drip is normally open as shown, and closes when the flow of water through it exceeds five to seven gallons a minute.

W D Allen Mfg Co 650 S 25th Av Bellwood Ill
Cat. No. 26. Fig. 2112. ½ in.

"Automatic" Sprinkler Corp of America Youngstown O

Central Automatic Sprinkler Co Inc Fourth St & Cannon Av Lansdale Pa

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 1 Box 750 Newark 1 N J

Grinnell Corp Providence R I

FLEXIBLE COUPLINGS

Flexible couplings are recommended for installation in sprinkler risers, and feed mains passing through walls from one building area to another, in locations subject to earthquake. They should also be installed in the discharge line from aboveground pump suction tanks. Flexible couplings may also be used in sprinkler systems when the length of run exceeds that of standard full pipe length, and when making new connections to existing feed mains; also in air or water service lines subject to excessive vibration or difficult alignment to prevent possibility of breakage.

Couplings of this type consist of bolted sleeves or clamps sealed with rubber rings, and the pipes are grooved or otherwise locked to prevent excessive movement.

Dresser Manufacturing Division Dresser Industries Inc Bradford Pa
Style 67. 4, 5, 6, 8, 10 in. Working pressure 500 psi.
Style 98-1. 2 to 8 in. For grooved pipe on aboveground installations only. Working pressure 500 psi.
Style 98-2. 2 to 8 in. For grooved pipe. Working pressure 1000 psi.

Eastern Sales Co Div of the Eastern Co 4700 Clairton Blvd Pittsburgh 36 Pa
Series 500. 2 to 8 in. For grooved pipe for aboveground installations only. Working pressure 500 psi.
Series 1000. 2 to 8 in. For grooved pipe. Working pressure 1000 psi.

Gustin-Bacon Mfg Co Kansas City Mo
Gruva-Grip Type GBR. 1¼ to 14 in. For grooved p
Working pressure 1000 psi (1¼ to 6 in.), 800 psi (8 to 12
300 psi (14 in.).
Rolagrip. 1¼ to 12 in. F r plain-end steel pipe. W
pressure 1000 psi (1¼ to 5 in.), 800 psi (6 to 10 in.), 600 psi (12
Gruvajoint Type GBL. 2 to 8 in. For grooved pipe for
ground installations only. Working pressure 500 psi.

Kuhns Brothers Co 1800 McCall St Dayton O
Fig. No. 400-D. 2 to 8 in. For grooved pipe for aboveg
installations only. Working pressure 400 psi.
Fig. No. 800-D. 2 to 8 in. For grooved pipe. Working pre
800 psi.

Victaulic Co of America 30 Rockefeller Plaza New York 20
Style 77D. 4, 5, 6, 8 in. For grooved pipe. Working pres
1000 psi (4, 5, 6 in.), 800 psi (8 in.).
Style 77. 1 to 14 in. For grooved pipe. Working pres
1000 psi (1 to 3½ in.), 800 psi (10, 12 in.), 300 psi (14 in.).
Roust-A-Bout Style 99. 2 to 8 in. For plain-end steel p
Working pressure 1000 psi (2 to 4 in.), 600 psi (5, 6 in.), 50
(8 in.).
Style 75. 2 to 8 in. For grooved pipe for aboveground ins
tions only. Working pressure 500 psi (2 to 8 in.).
Style 88. 2 to 6 in. For grooved pipe. Working pres
1000 psi.
Style 90. 1 to 6 in. For plain-end steel pipe. Working pres
600 psi (1 in.), 500 psi (2 in.), 400 psi (2½, 3 in.), 250 psi (4
200 psi (6 in.).

PIPE FITTINGS

Use of pipe fittings should conform to Fact
Mutual standards for installing sprinkler equipme

Victaulic Co of America 30 Rockefeller Plaza New York 20
Victaulic Full-Flow Fittings. ¾ to 12 in. Elbows (90°,
11¼°), adapter elbows (90°, 45°), tees, reducers, female adapt
caps. Working pressure 250 psi. Use with approved Victa
couplings.

Victaulic Plainlock Style 90 Fittings. 1 to 6 in. Elbows
45°, 22½°, 11¼°), adapter elbows (90°, 45°), tees, reducer te
adapter tees, reducers, bullplugs. Working pressure 60
(1 in.), 500 psi (2 in.), 400 psi (2½, 3 in.), 250 psi (4 in.), 20
(6 in.). Use with Style 90 and 99 couplings.

PIPE JOINTS

Three types of joints are commonly used in layi
underground fire mains. One is the conventional le
or lead-compound joint. Another is the standardi
mechanical joint which is held together by bolts th
force a rubber gasket into place. Still another us
special gasket material forced into place between th
bell and spigot or held in place by a sleeve.

JOINTS, Push-on, for Cast-iron

gle-gasket joints are approved for use when ed in accordance with Factory Mutual standards.

s Pipe Company Anniston Ala
Joint. 4 to 12 in.

n Cast Iron Pipe Co Birmingham 2 Ala
Joint. 4 to 24 in.

n B Cox & Sons Inc Coshocton O
Tite Joint. 3 to 24 in.

d States Pipe and Foundry Company Birmingham Ala
Joint. 4 to 24 in.

E JOINTS, Push-on, for Asbestos-cement

n approved joint for asbestos-cement pipe consists n asbestos-cement sleeve into which a specially d gasket is inserted in a circumferential groove each end of the sleeve. The pipe should be anchored in accordance with the pipe manufacturer's instructions.

Johns-Manville Corp 22 East 40th St New York 16 N Y
Ring-Tite Joint. Class No. 150, 4 to 16 in. for working pressures up to 150 psi. Class No. 200, 4 to 16 in. for working pressures up to 200 psi.

Keasbey & Mattison Co Ambler Pa
Fluid-Tite Joint. Class No. 150, 4 to 12 in. for working pressures up to 150 psi. Class No. 200, 4 to 12 in. for working pressures up to 200 psi.

PIPE JOINTS, Anchorage for Standardized Mechanical Joint

Special fittings are available for anchorage of mains having standardized mechanical joints.

American Cast Iron Pipe Co Birmingham 2 Ala
Mechanical Joint Retainer Glands. 3, 4, 6, 8, 10, 12 in. Used on an equal basis with tie rods and clamps to anchor fire mains. Setscrews must be tightened evenly to 80 ft/lb torque.

Porter D Dilley 1419 Atchison St Pasadena Cal
No. 312 Lug. No. 201 Spacer. Suitable for use with rods to anchor fire mains.

[fol. 1608]

HYDRANTS & HOSE

HYDRANTS

Hydrants are aboveground extensions from underground water mains equipped with valves and connections for attaching fire hose. On approved models, the barrel, bonnet, and boot are made of cast iron. The valve seat, valve guide, and other important working parts are of bronze. The hydrant valve is faced with rubber or leather. A weather cap on the operating stem nut prevents the accumulation of ice, which would cause the hydrant to bind. Hose nipples are threaded or leaded and pinned into the hydrant.

The valve is opened or closed by a 15 in. wrench fitted on the operating stem nut. To prevent freezing, any water in the hydrant barrel drains out at the bottom through a small valve which opens simultaneously as the hydrant is shut down after use.

The name of the manufacturer and the date are cast on the barrel; also the ground line and the working pressure. On the bonnet, an arrow and the word "open," show the direction for opening the valve. Hydrants with pumper connections are not recommended for installation within plant yards.

Combinations of hose nozzles (and/or pumper nozzles) other than those listed below may be accepted by the Factory Mutual Engineering Division.

All approved hydrants can be obtained with standardized-mechanical-joint inlet connections. The following are also available with Ring-Tite or Fluid-Tite inlet connections: American Foundry, Canada Valve & Hydrant, M. Greenberg's Sons, M & H, Mueller, and Traverse City. Hydrants so equipped are acceptable if anchored in accordance with Factory Mutual specifications.

Outlet nozzles are for 2½-in. hose. Hydrants with three outlets can be obtained with independent hose-gate valves. Hydrant sizes shown are the inside diameter of the main hydrant valve. Hydrants are dry-barrel except as noted.

American Foundry and Mfg Co 920 Palm St St Louis Mo
Two-nozzle Hydrant. 4¼, 5¼ in.
Three-nozzle Hydrant. 6¼ in.

Canada Valve & Hydrant Co Ltd Brantford Ont
Two-nozzle Hydrant. Darling B50B. 4½ in.

Darling Valve and Mfg Co Williamsport Pa
Two-nozzle Hydrant. Darling B50B. 4, 4½ in.
Three-nozzle Hydrant. Darling B50B. 5, 6 in.

M. Greenberg's Sons 765 Folsom St San Francisco Cal
Two-nozzle Hydrant. Cascade. 5 in.
Two-nozzle Wet-barrel Hydrant. No. 74

Kennedy Valve Mfg Co Elmira N Y
Two-nozzle Hydrant. K-12. 4½, 5¼ in.
Two-nozzle Hydrant. Fig. 1100. 5¼ in.

John C Kupferle Foundry Co 813 Hempstead St
Two-nozzle Hydrant. 5¼ in.

M & H Valves & Fittings Co P O Box 151
Two-nozzle Hydrant. MH. 4¼, 5¼, 6¼ in.

T McAvity & Sons Ltd Rothesay Av St John N B
Two-nozzle Hydrant. No. 2. 5¼ in.

Mueller Co 2501 Chestnut St Chattanooga Tenn
Two-nozzle Hydrant. 8H. 4¼, 5¼ in.
Three-nozzle Hydrant. 8H. 6¼ in.

Traverse City Iron Works 121-151 Lake Av
Two-nozzle Hydrant. UT. 5¼ in.
Three-nozzle Hydrant. UT. 6¼ in.

HYDRANT VALVES

Hydrants can be obtained equipped with
valves on the individual outlets. The following
facturers produce approved hydrant valves
bolted type.

American Foundry & Mfg Co 920 Palm St St Louis Mo
Darling Valve & Mfg Co Williamsport Pa
Kennedy Valve Mfg Co Elmira N Y
Cat. Fig. 109.
Ludlow Valve Mfg Co Inc Troy N Y
M & H Valve & Fittings Co Anniston Ala
T McAvity & Sons Ltd St John N B
Mueller Co 2501 Chestnut St Chattanooga Tenn
Traverse City Iron Works Traverse City Mich

FIRE HOSE

For ordinary outdoor service, woven single-jac
rubber-lined fire hose is recommended. If yard surfa
are rough and will cause heavy wear, or if wa
pressures are over 150 psi, double-jacket hose is advis
Hose that may come in contact with acid, acid fum
or other corrosive materials should be rubber-cover
If the hose must be stored in a damp location it sho
be purchased mildewproofed unless the jacket is wo
entirely of synthetic fibers.

For indoor service, lightweight single-jacket rubb
lined hose or linen hose is usually used.

Selection of hose size depends upon the amount
water that might be needed for combustibles in an ar
In some locations hose houses will need all 1½-in. ho
or all 2½-in. hose; in others, some of each. Hose ins
buildings is usually 1½-in., but 2½-in. is needed f

Woven single-jacket rubber-lined hose.

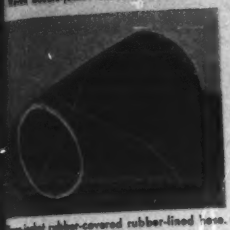
Hydrant valve.

Hydrant.

Woven double-jacket rubber-lined hose.

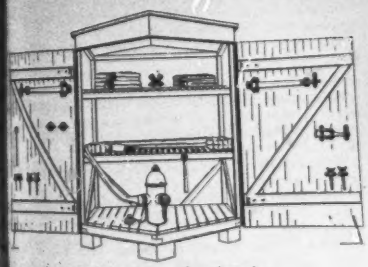
Angle hose valve.

Straightway hose valve.

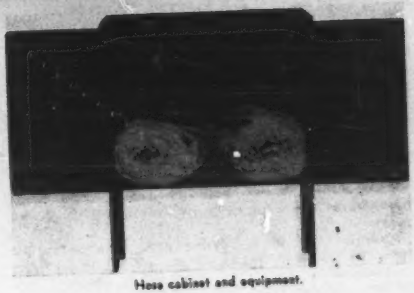


Woven-jacket rubber-covered rubber-lined hose.

Unlined linen hose.



Hose house and equipment.



Hose cabinet and equipment.

occupancies where the smaller hose might prove inadequate.

The amount of hose needed is dependent on the distance between hydrants or hose stations, the height of buildings, and the estimated number of hose streams that will be required.

Unless otherwise noted, single-jacket hose has been tested to 300 psi and double-jacket to 400 psi.

FIRE HOSE, Woven-jacket, Lined

Acme-Hamilton Mfg Corp Box 351 Trenton 3 N J

Hamilton FM. 1½, 2½ in. Single jacket, double jacket, and rubber covered. Cotton warp and filler.

EZE-Pak. 1½ in. Lightweight. Cotton warp, synthetic filler. Neoprene lined. For indoors only.

Super Service. 1½, 2½ in. Single jacket, neoprene lined. Synthetic warp and filler. Tested to 500 psi.

American Biltrite Rubber Co (Canada) Ltd 76 Avenue Rd Toronto 3 Ont

Biltrite Latex. 1½, 2½ in. Single jacket. Lightweight. Cotton warp, synthetic filler. Latex lined. For indoors only.

George Angus Canada Ltd 11 Curity Av Toronto 16 Ont

Classic 500. 1½, 2½ in. Single jacket. Cotton warp, synthetic filler.

Classic Metropolitan. 1½, 2½ in. Double jacket. Cotton warp and filler.

Classic Nyflex. 1½, 2½ in. Double jacket. Cotton warp, synthetic filler.

500 Heavy Duty. 1½, 2½ in. Single jacket. Cotton warp, synthetic filler. Reinforced latex lining.

500 Duty. 1½, 2½ in. Single jacket. Cotton warp, synthetic filler. Reinforced latex lining.

Streamlined Nyflex. 1½, 2½ in. Double jacket. Cotton warp, synthetic filler. Reinforced latex lining.

Snakeskin Life Duty. 1½, 2½ in. Single jacket. Cotton and synthetic warp, synthetic filler. Reinforced latex lining. Plastic protective cover.

Streamlined Rack. 1½ in. Single jacket. Cotton warp, synthetic filler. Reinforced latex lining. For indoors only.

Approved Equipment Manufacturing Co Inc 2026 83rd St North Bergen N J

1½, 2½ in. Single and double jacket. Cotton warp and filler.

1½, 2½ in. Single and double jacket. Cotton warp, synthetic filler.

Bi-Lateral Fire Hose Co 20 N Wacker Dr Chicago Ill

Bi-Lateral. 2½ in. Single jacket, double jacket, and rubber covered. Cotton warp and filler.

Bi-Lateral Fire Hose Box 351 Kitchener Ont

1½, 2½ in. Single jacket. Cotton warp and filler.

Blaze Guard Mfg Co North Bergen N J

Blaze Guard. 1½, 2½ in. Single and double jacket. Cotton warp and filler.

Blaze Guard. 1½, 2½ in. Single and double jacket. Cotton warp, synthetic filler.

Blaze-Flex. 1½ in. Single jacket. Lightweight. Cotton warp and filler. For indoors only.

Boston Woven Hose & Rubber Co 29 Hampshire St Cambridge Mass

Boston 600. 1½, 2½ in. Double jacket. Cotton warp, synthetic filler. Tested at 600 psi.

Cardinal (red). 1½, 2½ in. Single jacket. Synthetic warp and filler. Neoprene lined. Tested at 500 psi.

Red Queen. 1½, 2½ in. Single jacket. Lightweight. Cotton warp, synthetic filler, neoprene lined. For indoors only.

Red King. 1½, 2½ in. Single jacket. Lightweight. Synthetic warp and filler, neoprene lined. For indoors only.

Bull Dog. 1½, 2½ in. Single jacket. Cotton warp, synthetic filler.

Gold Crown (yellow). 1½, 2½ in. Double jacket. Synthetic warp and filler.

Bull Dog. 1½, 2½ in. Single jacket, double jacket, and rubber covered. Cotton warp and filler.

Dunlop Canada Ltd 870 Queen St E Toronto 8 Ont

1½, 2½ in. Single jacket. Cotton warp and filler.

1½, 2½ in. Rubber covered. Cotton warp and filler.

Fabric Fire Hose Co Sandy Hook Conn

1½, 2½ in. Single jacket. Cotton warp, synthetic filler.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Fyrman. 1½, 2½ in. Single jacket, double jacket, and rubber covered. Cotton warp and filler.

General Fire Extinguisher Corp Canada Ltd 970 St Luke Rd Windsor Ont

1½, 2½ in. Single jacket. Lightweight. Cotton warp, synthetic filler. Latex lining. For indoors only.

Goodall Rubber Co Inc Whitehead Rd Trenton 4 N J

Fire Queen. 1½, 2½ in. Single jacket, double jacket, and rubber covered. Cotton warp, synthetic filler.

EZflex. 1½, 2½ in. Single and double jacket. Cotton warp, synthetic filler. Reinforced latex lining.

Syn-Flex. 1½, 2½ in. Rubber covered. Cotton warp, synthetic filler. Reinforced latex lining.

Lite-Flex. 1½, 2½ in. Neoprene impregnated single jacket. Cotton warp, synthetic filler. Reinforced latex lining.

Dri-Rack. 1½, 2½ in. Single jacket. Lightweight. Cotton warp, synthetic filler. Reinforced latex lining. For indoors only.

Coral-Flex. 1½, 2½ in. Single jacket, impregnated and coated with plastic. Cotton and synthetic warp, synthetic filler. Reinforced latex lining.

B F Goodrich Co 500 S Main St Akron 18 O

Signal. 1½, 2½ in. Single jacket. Cotton warp and filler.

Mainstay. 1½, 2½ in. Single jacket. Cotton warp, synthetic filler.

BFG. 1½, 2½ in. Double jacket. Cotton warp and filler.

Cascade. 1½, 2½ in. Double jacket. Cotton warp, synthetic filler.

Sentry. 1½, 2½ in. Rubber covered. Cotton warp, synthetic filler.

Commander. 1½, 2½ in. Rubber covered. Cotton warp, synthetic filler.

Imperial. 1½, 2½ in. Single jacket. Synthetic warp and filler. Neoprene lined. Tested to 500 psi.

High Duty. 1½, 2½ in. Single jacket. Synthetic warp and filler.

Goodyear Tire & Rubber Co Inc Akron 16 O

Styles M-300, M-300-N (neoprene lining). 1½, 2½ in. Single jacket. Cotton warp, synthetic filler.

Styles M-400, M-400-N (neoprene lining). 1½, 2½ in. Double jacket. Cotton warp, synthetic filler.

Style MH-300. 1½, 2½ in. Cotton warp, synthetic filler. Neoprene covered.

Styles D-300, D-300-N (neoprene lining). 1½, 2½ in. Single jacket. Synthetic warp and filler. With or without neoprene impregnation.

Mascot, Mascot-N (neoprene lining). 1½, 2½ in. Single jacket. Cotton warp, synthetic filler. (For American LaFrance only.)

...gade, Brigade-N (neoprene lining). 1½, 2½ in. Double ...er. Cotton warp, synthetic filler. (For American LaFrance ...)

...ber Tire & Rubber Co of Canada Ltd New Toronto Ont
(Goodyear-Underwriters). 1½, 2½ in. Single jacket. Cotton ..., synthetic filler.

...ber Division Hewitt-Robins Inc 240 Kensington Av ...falo 5 N Y
1½, 2½ in. Single jacket, double jacket, and rubber covered. ...ton warp and filler.
...Jack N Reel. 1½ in. Single jacket. Lightweight. Cotton ..., synthetic filler. For indoors only.

...ber Co Trenton N J
...Fire Fighter. 1½, 2½ in. Single jacket. Cotton warp and filler.

...Equipment Co Inc 61 O'Connell Av Dorval P Q
...Armor. 1½ in. Single jacket. Armadillo (with protective ...ustic impregnation). Lightweight. Ramie warp, synthetic ...ller. For indoors only.
...Armor. 2½ in. Single jacket. Ramie warp, synthetic filler.

...ber Works H K Porter Co Inc Thermoid Div Box 791 ...Pittsburg Calif
2½ in. Single jacket, double jacket, and rubber covered. Cot...n warp and filler.

...K Porter Co Inc Thermoid Div Comly & Tacony Sts Phila...delphia 24 Pa
...Yankee Chief. 1½ in. Single and double jacket. Cotton warp ...d filler.
...Yankee Chief. 2½ in. Single jacket, double jacket, and rubber ...vered. Cotton warp and filler.
...Petrochem. 1½, 2½ in. Single jacket. Synthetic warp and ...ller. Neoprene lined. Tested to 500 psi.
...Super Quo-Flex. 1½, 2½ in. Single jacket. Synthetic warp ...d filler. Neoprene lined.
...Quo-Flex. 1½ in. Single jacket. Lightweight. Cotton warp, ...nthetic filler. For indoors only.
...Duo-Flex. 2½ in. Single jacket. Cotton warp, synthetic ...ler. Neoprene lined.

...Manhattan Inc Manhattan Rubber Div Passaic N J
...Dependable or Economy. 1½ in. Single jacket. 2½ in. Single ...cket, double jacket, and rubber covered. Cotton warp and filler.
...Dependable. 2½ in. Single and double jacket with mildew ...atment. Cotton warp and filler.

...ic Rubber Div Lee Rubber & Tire Corp Youngstown O
...Hydro. 1½, 2½ in. Single jacket, double jacket, and rubber or ...eoprene covered. Cotton warp, synthetic filler.
...Pneumo. 1½ in. Single jacket. Lightweight. Cotton warp ...d filler. For indoors only.
...Cobaltex. 1½ in. Single jacket. Lightweight. Cotton warp, ...nthetic filler. Neoprene lined. For indoors only.

...ted States Rubber Co 1230 Av of the Americas New York ...20 N Y
...FM Grade. 1½, 2½ in. Single jacket, double jacket, and rubber ...vered. Cotton warp and filler.
...FM Grade. 1½, 2½ in. Single jacket, double jacket, and ...bber covered. Cotton warp, synthetic filler.
...FM Grade. 1½, 2½ in. Single jacket. Synthetic warp and ...ller.

...ersal Fire Hose Mfg Co Inc North Bergen N J
1½, 2½ in. Single and double jacket. Cotton warp and filler.
1½, 2½ in. Single and double jacket. Cotton warp, synthetic ...ller.
Tuf-Flex. 1½ in. Single jacket. Lightweight. Cotton warp ...d filler. For indoors only.

FIRE HOSE, Unlined Linen

George Angus Canada Ltd 11 Curity Av Toronto 16 Ont
1½, 2½ in.

Approved Equipment Manufacturing Co Inc 2026 83rd St North Bergen N J
1½, 2½ in.

Blaze Guard Mfg Co North Bergen N J
Blaze Guard. 1½, 2½ in.

Federal Fire Hose Mfg Co 516 S Oaks St Compton Cal
1½ in.

Fire Guard Corp 1685 Sherman Rd Northbrook Ill
1½, 2½ in.

General Fire Extinguisher Corp (Canada Ltd) 978 St Luke Rd Windsor Ont
1½, 2½ in.

Goodall Rubber Co Whitehead Rd Trenton 4 N J
Atlantic. 1½, 2½ in.

Charles Niedner's Sons Co Inc 10 James St Malden Mass
Rendein. 1½, 2½ in.
Black Line. 1½, 2½ in.

Charles Niedner's Sons Coatlcook Quebec
Rendein. 1½, 2½ in.
Yankee. 1½, 2½ in.

Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Son Jasper and York Sts Philadelphia 25 Pa
Stempel. 1½, 2½ in.

Stevens Linen Associates Webster Mass
Stevens Gold Stripe. 1½, 2½ in.

Universal Fire Hose Mfg Co Inc No Bergen N J
1½, 2½ in.

HOSE VALVES

One-and-a-half-inch hose valves may be used on connections from sprinkler systems; 2½-in. valves are used on hose standpipes and fire-pump headers. For pressures above 175 psi, a 300-lb valve should be used with a reducing valve or an orifice restriction to prevent excessive pressure on the hose.

HOSE VALVES, Angle

W D Allen Mfg Co 650 S 25th Av Bellwood Ill
Fig. 174. 1 x 1½ in. 175 lb.
Figs. 170U, 171U. 1½, 2½ in. 175, 300 lb.

Croker Fire Prevention Div of Fire End & Croker Corp 656 Gerard Av New York 51 N Y
1½, 2½ in. 300 lb.

Elkhart Brass Mfg Co Elkhart Ind
Figs. U-20, U-25. 1½, 2½ in. 300 lb.

Fairbanks Co Binghamton N Y
Cat. Fig. 084. 1½, 2½ in.

Jenkins Bros Bridgeport Conn
Fig. 718. 1½, 2½ in. 175 lb.

Kennedy Valve Mfg. Co Elmira N Y
Cat. Fig. 93. 2½ in. 175, 300 lb.

Powhatan Brass & Iron Works Ranson W Va
1½, 2½ in. 300 lb.

Plates 157U, 158U. 1½, 2½ in. 175 lb
Plate 252. 1 x 1½ in. 175 lb.

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich
Plate 157U. 2½ in. 175 lb.
Plate 158U. 1½, 2½ in. 175 lb.

Walworth Co Inc So Braintree Mass
Cat. No. 350. 1½, 2½ in. 175 lb.

HOSE VALVES, Straightway

W D Allen Mfg Co S 650 25th Av Bellwood Ill
Fig. 15B.

Crane Co 4100 S Kedzie Av Chicago Ill
Cat. No. 453. 1½, 2½ in. 300 lb.
Cat. No. 451. 1 to 2½ in. 175 lb.

Darling Valve & Mfg Co Williamsport Pa
No. 11 Swivel. 2½ in.
No. B-41.

Fairbanks Co Binghamton N Y
Cat. Fig. 0210. 1½, 2½ in.

M Greenberg's Sons 765 Folsom St San Francisco 7 Cal
No. 1064. 1½, 2½ in. 300 lb.

Jenkins Bros Bridgeport Conn
Cat. Fig. 707. 1½, 2½ in.

Jenkins Bros Ltd 150 St Joseph St Lachine P Q
Fig. 707.

Kennedy Valve Mfg Co Elmira N Y
Cat Fig. 38.

Ludlow Valve Mfg Co Inc Troy N Y

Lunkenheimer Co Cincinnati O
Cat. Fig. 365. Flanged inlet. ¾ to 2½ in.
Cat. Fig. 366. Screw inlet. ¾ to 2½ in.
Cat. Fig. 1309. Cap and chain.

Powhatan Brass & Iron Works Ranson W Va
Fig. 281. 2½ in. 300 lb.

Walworth Co Inc So Braintree Mass
Cat. No. 15. 2½ in. 175 lb.

HOSE HOUSES

Standard designs of hose houses provide well-protected shelters for hose and equipment at various points in a plant yard. They are usually placed at hydrants, and should be located so as to permit easy attachment of hose to each outlet.

The type and amount of equipment needed for individual hose houses will depend on the needs of the immediate area. This may call for all 1½-inch hose, all 2½-inch hose, or some of each. Amounts of either 1½-inch or 2½-inch hose other than those shown in the following schedule may be provided, depending on local conditions of occupancy and combustibility of construction.

Each hose house should contain the following minimum equipment:

1. Approved 2½-in. woven-jacket rubber-lined hose (200 ft total).
2. Approved 1½-in. woven-jacket rubber-lined hose (100 ft).
3. Gated 2½ by 1½ by 1½-in. wye.
4. Playpipes (two) for 2½-in. hose with 1½-in. or equivalent 1-in. shutoff nozzle tip.
5. Playpipe (one) for 1½-in. hose with ⅝-in. or 13/16-in. shutoff nozzle. (Combination nozzle may be substituted.)
6. Adapter fittings 2½-in. to 1½-in.
7. Hydrant wrenches (two).
8. Spanners (two) for 1½-in. hose.
9. Spanners (four) for 2½-in. hose

The following concerns can furnish the knockdown parts for approved hose houses, and complete directions for assembly.

W D Allen Mfg Co 650 S 25th Av Bellwood Ill

"Automatic" Sprinkler Corp of America Youngstown O
Fig. 6-300. Plywood.

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind

Globe Automatic Sprinkler Co Div of the Fyr-Fyter Co Rust Box 750 Newark 1 N J
Almetl.

Grinnell Corp Providence 1 R I
Model A. Fig. 1347. Sheet steel.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich
Seco. Model H-1. Steel.
Seco. Model C-5. Low silhouette. Steel.

Van Loon Industries 3409 E McNichols Rd Detroit 12 Mich
Models 60, 60-L. All-metal.

H G Vogel Co 1101 Slocum Av Ridgefield N J

Winston Company Houston Tex
Types 202, 204. Steel.

HOSE CABINETS

Cabinets for yard use are suitable where space is limited, or where the usual hose house would not be desirable for other reasons. They can be either attached to a building wall or placed on iron-pipe legs or on a concrete foundation near any hydrant. The cabinet will hold 250 ft of 2½-inch hose, together with nozzle, spanners and other accessories. The size and design may be varied to accommodate the type and amount of equipment selected as most suitable.

W D Allen Mfg Co 650 S 25th Av Bellwood Ill
Allenco Factory and Yard Fire-hose Equipment Cabinet. Steel.

Globe Automatic Sprinkler Co Div of the Fyr-Fyter Co Rust Box 750 Newark 1 N J
Almetl.

Seco Manufacturing Inc 4461 W Jefferson Av Detroit 9 Mich
Model C-10. Steel hose cabinet.

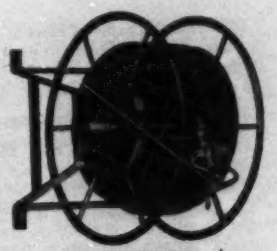
Van Loon Industries 3409 E McNichols Rd Detroit 12 Mich
Model 369-P. Roof hose cabinet. Steel.

HOSE RACKS

Hose racks of several types are available for 1½-in. and 2½-in. linen and lightweight woven-jacket rubber-lined hose. Smaller hose should be limited to light-hazard occupancies.

...-control hose station.

Hose rack.



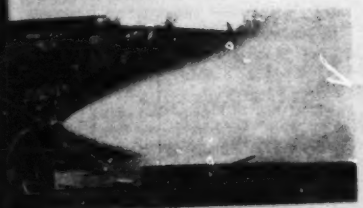
Continuous-flow hose reel.

Underwriter playpipe.

Hose couplings.

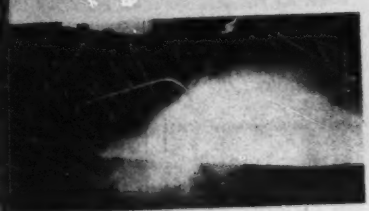
Monitor nozzle.

Short playpipe.



Water-spray nozzle, long range, narrow angle.

Combination nozzle for fire hose.



Water-spray nozzle, short range; wide angle.

Combination nozzle for garden hose.

It is preferable to fasten racks to wall or clamp them to risers. It is not desirable to suspend them on nipples smaller than two inches, except in hose cabinets where the supply pipe is rigidly supported at the hose valve.

W D Allen Mfg Co 450 S 23th Av Bellwood Ill
The Hartford. Fig. 144.
Allenco Improved Bowes Hose Rack. Figs. 140, 141, 142.
Pin-type. Styles E, F, G.
Allenco Fire-hose Station. Recessed and wall mounted. Holds ¾ in. linen hose in 30, 40, 50, and 75 ft lengths.
Allenco Hosegard Semiautomatic Hose Cabinets. Figs. 7168N, 7169N, 7172N, 7178N.

Boston Coupling Co 293 Congress St Boston Mass
Boston Swinging Hose Rack.

Croker Fire Prevention Div of Fire End & Croker Corp 656 Gerard Av New York 51 N Y
A.B.C.

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind
FM Pin and Box Type.

Fire Guard Corp 1685 Shermer Rd Northbrook Ill
Model U Semiautomatic Pin Hose Rack. Capacity 50, 75, 100 ft 1½-in. unlined linen hose.

Fyr-Fyter Co 221 Crane St Dayton O
Type SAF. Model 411.
Type NAF. Models 410, 412

General Fire Extinguisher Corp 8740 Washington Blvd Culver City Cal
Model U Semiautomatic Pin Hose Rack. Capacity 50, 75, 100 ft 1½-in. unlined linen hose.

Standard Fire Hose Co 9th & Colorado Av Santa Monica Cal
Model 85 Semiautomatic Pin Hose Rack. Capacity 50, 75, 100 ft 1½-in. unlined linen hose.

Wirt & Knox Mfg Co Sedgley Av York & 23rd Sts Philadelphia Pa
Hump Hose Rack. Style TS.

HOSE REELS

Continuous-flow reels for fire hose are used for fixed installations and mobile apparatus. Full flow is delivered regardless of the amount of hose unreeled. Available for ¾ to 1½-in. rubber hose.

Clifford B Hannay & Son Inc Westerlo N Y
Reels for fire service and general industrial liquid handling, including fuel. Working pressures up to 1,500 psi. Hose normally not supplied by manufacturer.

Wirt & Knox Mfg Co Sedgley Av York & 23rd Sts Philadelphia Pa
Style FD47-1-100, FD47-1-200, FD47-1½-50, FD47-1½-100. Horizontal and vertical mounting. Tested to 500 psi.

HOSE-STATION CONTROL

A remote-control hose-valve station is designed for unheated areas such as warehouses, open platforms, or other locations where freezing might occur if the piping were kept filled with water. The water supply is controlled by a deluge valve in a heated area.

The hose station consists of a tripping device in a break-glass type box mounted near the Breaking of the glass with the hammer provided leases a spring-loaded rubber diaphragm which air pressure through a copper tube to operate deluge valve. The hose is then put into use by op the valve in the usual way.

In another arrangement, the tripping device is a of the hose valve, and is operated automatically the handwheel of the valve is opened manually.

Any wet standpipe installation can be converte a dry standpipe with a remote-control hose-v station and a deluge valve.

"Automatic" Sprinkler Corp of America Youngstown O

HOSE COUPLINGS

Approved couplings are of the expansion-ring t They consist of a male and female coupling threaded to conform to the National American Stand thread, unless otherwise specified. Threads als conform to existing threads on municipal fire-h couplings and fittings. Standard sizes are 1½ 2½ in. They are available for woven-jacketed rubb lined hose, whether single-jacket, double-jacket, rubber-covered and for unlined linen hose. The 1½ size is obtainable for replacement purposes only.

The couplings have either a pin lug or a rocker with which a spanner wrench is used in making a t joint. If both types of coupling are used in one pi provide spanners to fit each type.

Akron Brass Mfg Co Inc Wooster O
1½, 2½ in.

W D Allen Mfg Co 560 S 25th Av Bellwood Ill
1½, 2½ in.

Bar-Way Mfg Co Stamford Conn
Models 3150-8, 3150 (1½ in.). 4250-8, 4250 (2½ in.). (2½ x 3 in.). 8 denotes single jacket.

Boston Coupling Co 293 Congress St Boston Mass
2½ in.

E M Clayton Co Div of John W Moon 223-236 Cherry Philadelphia 6 Pa
1½, 2½ in.

Croker Fire Prevention Div of Fire End & Croker Corp Gerard Av New York 51 N Y
1½, 2½ in.

Elkhart Brass Mfg Co 1302 W. Beardsley Av Elkhart Ind
1½, 2½ in.

T McAvity & Sons Ltd St John N B
2½ in.

Powhatan Brass & Iron Works Ranson W Va
1½, 2½ in.

United States Rubber Co 1230 Avenue of the Americas York 20 N Y
2½ in.

Wilson & Cousins Ltd 240 Birmingham St Toronto 14 Ont
1½, 2½ in.

RE-HOSE MENDER

A fire-hose mender is intended for emergency repair of burst, burst, or otherwise damaged fire hose. It is not to be used for permanent repair. After the use, the mender should be removed and the hose replaced or discarded.

Rubber Co Whitehead Rd Trenton N J
Cushlite. 1½ in. Max hose OD 1¾ in.

PLAYPIPES

Playpipes for industrial fire fighting are designed for use on 2½-in. approved fire hose. One type, for general use, has a 30-in. barrel and is known as the standard underwriter playpipe. A short playpipe having a 15-in. barrel is for use on ladders where space is restricted. Barrels are of rolled brass or seamless drawn copper, with a detachable tip having a 1⅛-in. orifice. Swivel handles provide a good handgrip for two persons.

Brass Mfg Co Inc Wooster O
Underwriter and short playpipes.

D Allen Mfg Co 650 S 25th Av Bellwood Ill
Underwriter and short playpipes.

Coupling Co 293 Congress St Boston Mass
Underwriter playpipes.

Brass Mfg Co 1302 W Beardsley Av Elkhart Ind
Underwriter and short playpipes.

Holmire Brass Works 377 Putnam Av Cambridge 39 Mass
Short playpipes.

Brass & Iron Works Ranson W Va
Underwriter and short playpipes.

& Cousins Ltd 240 Birmingham St Toronto 14 Ont
Underwriter playpipes.

WATER-SPRAY NOZZLES, for Fire Hose

Portable water-spray nozzles are manual fire-fighting devices usually provided to supplement automatic fire-fighting equipment. They are suitable for use on fires in ordinary combustibles, in flammable liquids with flash point above 150°F either spilled or in open tanks, and in oil-filled electrical equipment.

The three kinds of fires and the types of nozzle approved for them are:

A. *Ordinary Combustibles.* While any spray nozzle listed is to some extent suitable for use on fires in ordinary combustibles those with narrow-angle discharge are approved because of their effective range.

B. *Flammable Liquids with Flash Point above 150°F.* Nozzles approved for use on fires in flammable liquids with flash point above 150°F in open tanks produce a cone-angle discharge not less than 120°. To permit close approach for maximum effectiveness they must be equipped with 6- to 12-ft lightweight applicators.

Approved nozzles discharging a narrow-angle (30-90°) high-velocity spray are effective for controlling flammable-liquid spill fires, fires in open tanks containing flammable liquids with flash point above 200°F, and for cooling closed containers exposed to heat. They are generally not suitable for extinguishing fires in lower flash point flammable liquids in open tanks or pans.

C. *Electrical Equipment.* Nozzles approved for use on fires in electrical equipment produce a long-range, narrow-angle (30-90°) high-velocity spray only. They are suitable for use on fires in oil-filled electrical equipment such as small transformers and oil switches at voltages up to 250,000 when used at a distance of not less than 8 ft. Before attempting to extinguish a fire, electrical equipment should be de-energized if possible.

Nozzles producing a solid stream or those employing applicators are not suited for this type of fire.

Explanation of Listings. Hose threads are national standard unless otherwise indicated. Discharge and discharge angle are shown for 50 psi pressure.

Factory Mutual approval designations are as follows:

A. Fires in ordinary combustibles.
B1. Fires in flammable liquids with flash point above 150°F in open tanks.
B2. Fires in flammable liquids with flash point above 200°F in open tanks, and for spill fires.
C. Fires in electrical equipment.

Main suitability is listed first. Secondary suitability is given in parenthesis. While all nozzles to some extent are useful on fires in ordinary combustibles, the A designation is affixed below only to those primarily intended for this class of fires.

W D Allen Mfg Co 650 S 25th Av Bellwood Ill
Combination Water-spray Nozzle.

	Hose thread, in.	Discharge, gpm	Discharge angle, deg	Type of fire for which approved
7171	1½	44 (stream) 83 (spray)	90 max	A

Water-spray Nozzle.

7160	1½	66	75	C, (B2)

American LaFrance Elmira N Y
Poweron Water-spray Nozzle. Hollow-cone discharge.

P-6-A	1½	68	53	B2(C)
P-10-A	2½	117	30	B2(C)

"Automatic" Sprinkler Corp of America Youngstown O
Fire-Fog Nozzle. Manufactured by Spray Engineering Co., Burlington, Mass.

667B	¾ ip	11	95	B2
668B	1 ip	18	70	B2
6610CN	1½	68	75	B2(C)
6610DN	1½ Navy	68	75	B2(C)
6610HB, for playpipe 863.	1½ ip	89	75	B2(C)
6611HB, for playpipe 862.	2 ip	154	70	B2(C)

E M Clayton Co Div of John W Moon 228-336 Cherry St Philadelphia 6 Pa
Industrial Fog Nozzle. Combination Water-spray Nozzle.

	1½	31 (stream) 53 (spray)	120 max	A

Elkhart Brass Manufacturing Co Elkhart Ind
Combination Water-spray Nozzle.

L265	1½	43 (stream) 66 (spray)	90	A

	Hose thread, in.	Discharge, gpm	Discharge angle, deg	Type of fire for which approved
Grinnell Corp Providence 1 R I				
Multifyre B Spray Pipe.				
	1½	46	75	B2(C)
	2½	87	85	B3(C)
Powhatan Brass & Iron Wks Ranson W Va				
Industrial Fog Nozzle. Combination Water-spray Nozzle.				
200	1½	29 (stream) 75 (spray max)	130 max	A
Rockwood Sprinkler Co Worcester Mass				
Waterfog Nozzle.				
N-22	¾°, 1°	15	70	B2
	1½	40	65	B2(C)
	2½	85	55	B3(C)
N-23	1½	58	55	B2(C)
	2½	157	50	B3(C)
Combination solid-stream water spray with shutoff, as follows. Available in aluminum or bronze.				
SG-60, SG-61	1½	20 (stream) 35 (spray)	40	A(B2)
	¾°, 1°	13 (stream) 17 (spray)	70	A(B2)
SG-47, SG-48	2½	219 (stream) 81 (spray)	50	A(B2)
Low-velocity spray nozzles with applicators, with or without shutoff, as follows:				
L-10-A (12-ft applicator)	2½	76	180	B1(B2)
L-11-A (10-ft applicator)	1½	43	180	B1(B2)
L-12-A (6-ft applicator)	¾°, 1°, 1½	11	180	B1(B2)
° National standard or iron-pipe thread.				
Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich				
[illegible]	1½	29 (stream) 75 (spray max)	130 max	A
555				
Spraying Systems Co 3201 Randolph St Bellwood Ill				
Fogjet Nozzles.				
1-11-¼ FB 18	1 in	20	40	C
1-1¼-0FB 35	1¼	30	45	C(B2)
1-1¼-0FB 50	1¼	50	45	C(B2)
1-1¼-0FB 70	1¼	72	45	C(B2)

WATER-SPRAY NOZZLES, Combination, for Garden Hose

Nozzles threaded for use with ordinary garden ho and developed particularly for textile mill lint fi where wide area coverage with a minimum quantity water is a desirable feature. Also suitable as first protection for small amounts of ordinary combusti

"Automatic" Sprinkler Corp of America Youngstown 1 O
Model No. 126. Combination flat spray and solid stream.

Bete Fog Nozzle Inc 309 Wells St Greenfield Mass
Bete. Model G-5 (combination cone spray and solid stre Model H-58P (solid cone spray). Model H-5D6 (flat spray). use with ⅝-, ¾-, or 1-in rubber hose.

MONITOR NOZZLES

The approved monitor nozzle is specially desig with large clear waterways to give a powerful, reaching stream for the protection of pulpwood pi lumber yards, or other locations where a large amo of water must be instantly available without the del of laying hose lines. The nozzle is furnished with th interchangeable tips 1½, 1¾, and 2 in.

F N McIntire Brass Works 377 Putnam Av Cambridge 39 M
Log-pile Nozzle.

FIRE PUMPS & GRAVITY TANKS

PUMPS

Before ordering a fire pump, consult the Factory Mutual Engineering Division regarding size, type of driver, suction supplies, and location. Give the manufacturer complete data, including rated capacity, net-rated pressure, and suction lift or head. Contracts for pump installations or changes should be let subject to acceptance of plans and satisfactory field tests by the Factory Mutual Engineering Division.

The pump manufacturer is responsible for furnishing complete, assembled unit consisting of pump, driver, and necessary accessories, all in accordance with Factory Mutual standards.

Satisfactory performance in an operating test after installation should be guaranteed. A new fire-pump installation is not acceptable until a Factory Mutual engineer has witnessed a satisfactory field-acceptance test. This will include a test of endurance of the pump and reliability of the power supply.

Proposals for fire-pump installations, including plans showing location and piping connections, should be sent to the Factory Mutual Engineering Division for review before the order is placed.

CENTRIFUGAL FIRE PUMPS, Horizontal-shaft

Approved horizontal-shaft centrifugal fire pumps are rated to a total suction lift of 15 ft. when delivering 90% of rated capacity.

In the listings below, rated net head pressure represents the amount of pressure boost obtainable from the pump of a given type and impeller size, when operating at rated speed. When the suction supply enters the pump under a positive head, as from a city water main, the rated net head pressure is the difference between the discharge pressure and the suction pressure at rated capacity. When the suction supply is taken under a lift, as from a pond or open pit, the rated net head pressure is the sum of the discharge pressure and the suction lift in psi at rated capacity.

A range of rated net head pressures indicates that impellers of various sizes are obtainable for the given type of pump.

All the manufacturers listed may drive their pumps with electric motor or steam turbine. The following in addition may also drive their pumps with internal-combustion engine: Allis-Chalmers, Canadian Ingersoll-Rand, Fairbanks Morse, Peerless, Pierre Thibault, C. H. Wheeler, and Worthington.

Allis-Chalmers Mfg Co Box 512 Milwaukee 1 Wis

Rated capacity, U.S. gpm	Rated net head, psi	Rated speed, rpm	Type designation	Suction inlet, dia in.	Discharge outlet, dia in.	Max horsepower	Stage
500	100	1750	HHF	6	4	63	1
500	60–100	3550	SHHF	5	4	25–56	1
500	130–170	3550	SKHF	5	4	77–100	1
750	60–100	3550	SHHF	5	4	40–71	1
750	125	3550	SKHF	5	4	84	1
1000	60–100	1750	KHF	6	5	53–87	1
1000	40	1750	KHFT	6	5	33	1
1000	101–125	1750	KHF	6	5	100–134	1
1500	60	1750	HF	8	6	77	1
1500	70–100	1750	HF	8	6	85–144	1
1500	100–108	1750	HF	8	6	144–166	1
1500	100–125	1750	HHF	10	8	140–200	1
2000	60–100	1750	HF	8	8	96–176	1
2500	100	1750	HF	10	8	228	1

Babcock-Wilcox and Goldie-McCulloch Ltd Galt Ont

500	100	1750	FF	6	4	48	2
750	100	1750	HS	8	6	70	1
750	100	1450	HHS	8	6	71	2
1000	100	1750	H	8	6	95	1
1000	100	1450	HH	8	6	95	2
1500	100	1750	K	10	8	154	1
1500	100	1450	KK	10	8	135	2
2000	150	1750	DJV	10	6	265	1
2500	100–120	1750	D			~330	1

Buffalo Pumps Div Buffalo Forge Co Buffalo 5 N Y

750	100	1750	SU	8	6	80	1
1000	100	1750	SU	8	6	93	1
1500	100	1750	SU	8	6	140	1

Canadian Allis-Chalmers Ltd Box 37 Montreal P Q

2000	125	1750	SJF	12	10		1

Canadian Ingersoll-Rand Co Ltd Sherbrooke P Q

1000	100	1750	FALVS		6	93	1
2000	100	1750	FALV	10	8	166	1

Chicago Pump Co Chicago Ill

500	40–60	1750	DL-4	5	4	19.5–52	1
500	100	1750	H-5-3	6	5	54	2
750	40–70	1750	D6-6	6	6	27–69	1
750	80–60	1750	DL-6				1
750	100	1750	DL-6				1
1000	40–70	1750	D6-6	8	6	33–72	1
1000	80–60	1750	DL-6				1
1000	100	1750	DL-8				1

Darling Brothers Ltd 140 Prince St Montreal 3 P Q

2000	100	1760	BNUD-W	10	8	150	1

DeLaval Steam Turbine Co Trenton N J

500	100	1760	K-6/6A	8	6	52	1
500	100	2300	K-8/6A	8	6		1
750	100	1760	K-6/6A	8	6	74	1
750	100	2300	K-8/6A	8	6		1
1000	100–140	1760	K-6/6A	8	6	96	1
1000	100–125	1760					1
1000	125–150	2300	K-6/6A	8	6	128–170	1
1000	150	1760	L-10/8	10	8	195	1
1000	150	2300	L-10/8	10	8	170	1
1500	100–140	1760	K-6/6A	8	6		1
1500	100–150	2300	K-8/6A	8	6	125–220	1
1500	150	1760	L-10/8	10	8	230	1
1500	150	2300	L-10/8	10	8	230	1
2000	100–125	1760	K-10/8A	10	8	160–208	1
2000	100–125	2300	K-10/8A	10	8		1
2000	100–150	1760	L-10/8	10	8	~230	1
2000	100–150	2300	L-10/8	10	8	~230	1

Fairbanks Morse & Co 3601 Kansas Av Kansas City Kan

500	40–75	1750	5813F	5	4	22–25	1
500	75–125	1750	5814F	5	4	28–58	1
500	90–160	2600	5874F	5	4	37–47	1
500	100	2000	5813F	5	4		1
500	100	2280	5813F	5	4		1
500	125	2300	5813F	5	4		1

Rated capacity, U.S. gpm	Rated net head, psi	Rated speed, rpm	Type designation	Suction inlet, dia in.	Discharge outlet, dia in.	Max horsepower	Stages
500	100–120	2500	5824F	5	4		1
500	121–135	3600	5874F	5	4		1
500	100–125	2900	5813F	5	4	-72	1
750	60–70	1750	5813F	6	5	29–47	1
750	71–125	1750	5814F	6	4		1
750	100	2500	5874F	6	5	68	1
750	101–125	3500	5874F	6	5	-84	1
750	100–125	2900	5813F	6	4	75–97	1
1000	40–50	1750	5813F	8	6	34–44	1
1000	51–80	1750	5814F	6	5	-89	1
1000	81–125	1750	5814F	6	5	-113	1
1000	100	2500	5812F	6	5	92	1
1000	40–44	1750	5813F	8	6		1
1500	45–69	1750	5813F	8	6		1
1500	70–90	1750	5813F	8	6		1
1500	91–140	1750	5814F	8	6	-194	1
2000	100–125	1750	5824F	10	8	172–222	1
2500	100–125	1750	5814F	10	8	207–259	1

Ingersoll-Rand Co Cameron Pump Div 11 Broadway New York N Y

750	100–125	3550	FUV	6	5	62–83	1
1000	100–125	3550	FUV	6	5	85–108	1
1500	100	1750	FALV	8	6	130	1
2000	100	1750	FALV	8	6	173	1

LeCourtenay Co Newark N J

750	100	1750					1
750	100	1750					2
1000	100	1750					1
1000	100	1750					2
1500	100	1750					1

Peerless Pump Hydrodynamics Div FMC Corp 2005 Northwestern Av Indianapolis 8 Ind

Dayton-Dowd Pumps.

500	40	1750	4ABF10	5	4	20	1
500	41–56	1750	4AF12-15	6	4	20–27	1
500	57–75	1750	4ABF13	5	4	29–42	1
500	76–94	2500	3ABF9	4	3	36–41	1
500	100	2400	4ABF12	5	4	55	1
500	95–125	3550	3ABF9	4	3	42–56	1
500	60–85	3550	4ABF10	5	4	31–34	1
500	70–75	3550	4ABF10	5	4	32–34.5	1
500	100–115	3000	4ABF10	5	4	57–69	1
500	100–175	1750	4TUF5	5	4	57–105	2
500	126–140	3550	3ABF9	4	3	57–72	1
500	141–165	3550	4ABF10	5	4	92–114	1
750	40–73	1750	5AF12	6	5	29–58	1
750	100	2900	4ABF12	5	4	72	1
750	70–115	1750	4ABF17	6	4	40–84	1
750	85–155	3550	4ABF10	5	4	58–114	1
750	100–109	3000	4ABF10	5	4	63–69	1
750	110–123	3000	4ABF17	6	4	79–93	1
750	101–180	1750	6TUF7	6	5	67–126	2
1000	40–71	1750	6AF13	8	6	34–67	1
1000	72–94	1750	5AF10	6	5	64–80	1
1000	95–100	1750	5AF10	6	5	84–89	1
1000	100–135	2400	5AF13	6	5	95–140	1
1000	100–185	3550	5ABF10¼	6	5	84–170	1
1000	105–180	3000	5ABF10¼	6	5	82–116	1
1000	90–125	1750	6AF10	8	6	88–124	1
1000	126–150	2900	5AF13	6	5	123–153	1
1000	116–210	1750	6TUF10	8	6	106–208	2
1500	40–89	1750	8AF12	10	8	53–70	1
1500	90–83	1750	8AF14	8	6	92–111	1
1500	84–100	1750	6AF16	8	6	103–129	1
1500	100	2400	6AF13	8	6	148	1
1500	100–180	1750	6AF15	8	6	136–205	1
1500	100–150	2500	6AF13	8	6	146–233	1
1500	151–175	1750	8TUF15	10	8	210–258	2
2000	100	1750	8AF20	10	8	160	1
2000	101–125	1750	8AF25	10	8	172–216	1
2500	100–110	1750	8AF20	10	8	200–222	1
2500	111–150	1750	8AF25	10	8	249–341	1

Pierre Thibault Canada Ltee Pierreville P Q

750	100	2220	TWS	6	3½	88	1

Warren Pumps Inc Warren Mass

500	100	1780	DL-16	4	3	52	1
750	100	1750	DL-10	6	4	90	1
750	100–150	1750	2H-16	6	6	68–113	2
1000	100	1750	DL-10	8	6	93	1
1000	200	1750	DL-10	8	6	135	1

C H Wheeler Manufacturing Co 19th St & Lehigh Av Philadelphia Pa

Wheeler Economy Fire Pumps

500	40–100	1780	ME	4	3	20–84	1
500	100–180	3550	MAA	6	5	57–118	1
1000	110–200	1770	DMD	4	3	61–119	2
750	50–70	1760	M	6	4	27–45	1
750	70–125	1760	M	6	5	45–84	1

Rated capacity, U.S. gpm	Rated net head, psi	Rated speed, rpm	Type designation	Suction inlet, dia in.	Discharge outlet, dia in.	Max horsepower
750	100	3550	M			
750	100–180	3550	MAA	5	4	74
1000	40–80	1760	MJ	6	5	72–92
1000	81–100	1760	M	6	6	92–97
1000	100	3450	M	6	5	97
1000	100	3550	MAA	6	5	97
1000	140–185	3550	MAA	6	5	135–170
1500	40–69	1760	MJ	8	6	92–116
1500	70–100	1760	MJ	8	6	133–143
1500	100–125	1760	MABS	8	6	143–178
2000	100	1800	M	10	8	187
2000	62–120	1760	M	10	8	183–241

Worthington Corp Harrison N J

500	40–60	1750	LS-2				
500	100–125	3600	LG-1	4	3	52–62	
500	125	1750	UB-1	4	3	52–62	
750	40–60	1750	LS-2	6	4	71	
750	60–100	3550	LG-10	5	4	71–94	
750	100–125	3550	LG-10	5	4	94–118	
750	100–125	1750	LG-1	5	4	94–118	
750	100–128	2900	LG-1	5	4	94–118	
750	128	1750	UB-1	5	4	118	
1000	75–100	3550	LG-10	6	5	94–118	
1000	100–125	1750	LG-1	6	5	94–118	
1000	100–125	2900	LG-1	6	5	94–118	
1000	100–125	3550	LG-1	6	5	94–118	
1000	100–125	3550	LG-10	6	5	94–118	
1000	125	1750	UB-1	6	5	118	
1500	100–125	1750	LG-1	8	6	139–165	
1500	100–125	2900	LG-1	8	6	139–165	
1500	125	1750	UB-1	8	6	165	
2000	100–125	1750	LG-1	8	6	183–229	
2000	100–125	3000	LG-1	8	6	183–229	

CENTRIFUGAL FIRE PUMPS, Horizontal-shaft, Limited-service

Horizontal-shaft electric-motor-driven limited-service fire pumps are of less capacity and are not substitute for standard fire pumps. They are similar in design to standard fire pumps. They must be under automatic control. Installation should be made only after careful consideration of the conditions in each case by the Factory Mutual Engineering Division.

C H Wheeler Mfg Co 19th St & Lehigh Av Philadelphia Pa

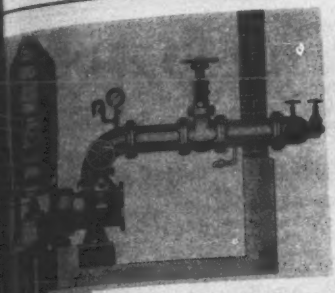
Rated capacity, U.S. gpm	Rated net head pressure, psi	Stage	Mfrs size, in.	Type designation	Speed, rpm
200	50–100	1	2x3	MH	
300	40–100	1	3x3	MH	
450	40–75	1	4x4	MH	

CENTRIFUGAL FIRE PUMPS, Vertical-shaft

Vertical-shaft turbine-type centrifugal fire pumps have a number of submerged impellers contained in a series-bowl assembly at the end of a vertical shaft. The design is similar to pumps used extensively in industrial and municipal service. An outstanding feature is the ability to operate without priming when the suction-water level is any distance below ground level (see installation standards). Vertical-shaft pumps may also be used in booster service, especially where space is limited.

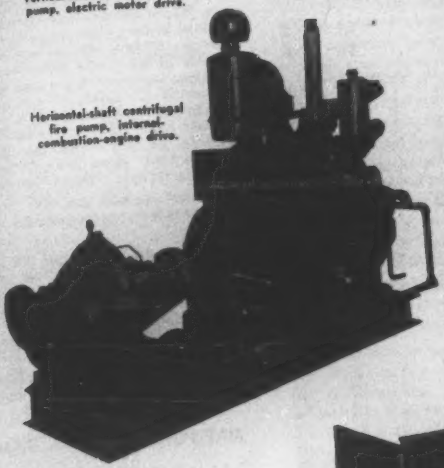
Each pump consists of a motor head, column pipe, line shaft, bowl assembly, and suction strainer. There are two types of discharge head, one designed for direct connection to underground mains and the other for aboveground discharge.

For electric drive, a vertical motor is equipped with



Vertical-shaft centrifugal fire pump, electric motor drive.

Horizontal-shaft centrifugal fire pump, electric motor drive.



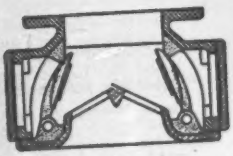
Horizontal-shaft centrifugal fire pump, internal-combustion-engine drive.

Controller for internal-combustion-engine driver.

Modified controller for limited service pump.

Standard controller.

Controllers for electric-motor drives, combined manual and automatic.



Foot valve.

Waterfall valve.

a thrust bearing to carry the load of the rotating parts in addition to the hydraulic thrust of the pump.

Fire pumps of this type may be driven by approved gasoline or diesel engines through approved right-angle gear drives.

The pumps listed below were shop-tested with line shafts 4 to 6 ft. long, so that the discharge pressures at ground level for rated capacity and speed are slightly less than the given total heads. In order to provide the pressure specified by the customer, the pump manufacturer may vary the number of stages and/or the impeller diameters.

Canadian Ingersoll-Rand Co Ltd Sherbrooke P Q

Rated capacity, U. S. gpm	Min size, in.	Type designation	Rated speed, rpm	Stages	Max bhp at rated rpm	Total head, pri. at rated gpm
1000	14	FAPH	1760	4	104	138
1500	14	FAPH	1875	4	135	150
2000	16	FAPH	1760	5	152	128
2000	16	FAPH	1785	5	200	132

Fairbanks Morse & Co 3601 Kansas Av Kansas City Kan

500	10	6822F & 6827F	1760	7	66	133
750	12	6822F & 6827F	1760	6	86	130
1000	14	6822F & 6827F	1760	3	79	100
1500	14	6822F & 6827F	1760	3	128	110
2000	16	6822F & 6827F	1760	2	161	100
3000	18	6822F & 6827F	1760	3	269	105
2500	16	6822F & 6827F	1760	2	217	108
3500	16	6822F & 6827F	1760	3	335	135

Ingersoll-Rand Co Cameron Pump Div 11 Broadway New York N Y

750	12	FAPH	1755	5	81	130
1000	14	FAPH	1765	4	112	130

Johnston Pump Co Pasadena Cal

500	12	A	1760	4	47	114
500	12	A	1760	6	68	168
750	12	A	1760	4	72	108
750	12	B	1760	6	102	162
1000	14	C	1770	3	109	130
1000	14	C	1770	4	140	184
1500	14	D	1770	3	158	116
1500	14	D	1770	4	184	154

Layne & Bowler Inc Memphis Tenn

500	12	FRKLC	1760	4	34	91
500	12	FRKLC	1770	6	67	216
750	12	FRKMC	1770	4	66	119
750	12	FRKMC	1770	6	136	242
1000	12	FTLC	1760	3	62	77
1000	12	FTLC	1760	6	123	164
1000	12	FTLC	1770	6	194	250
1500	15	FRMC	1770	3	127	111
1500	15	FRMC	1770	6	294	238
2000	17	FDRLC	1770	3	157	103
2000	17	FDRLC	1770	4	308	244
2500	17	FDROBC	1770	2	222	102
2500	17	FDRBC	1770	3	465	198

Peerless Pump Hydrodynamics Div FMC Corp 3005 Northwestern Av Indianapolis 8 Ind

750	12	MA	1760	5	71	112
1000	12	MA	1760	6	130	162
1500	14	MA	1760	3	130	102
2000	16	M	1760	3	206	135
2500	18	MA	1760	5	264	140

Worthington Corp Harrison N J

500	10	QF	1775	7	65	140
750	10	QHB	1775	4	80	130
1000	12	QF	1775	5	114	141
1500	14	QF	1775	3	140	112

FIRE-PUMP DRIVERS

Electric motors, steam turbines and internal combustion engines are suitable for driving fire pumps. Electric-motor drive is preferred.

Electric motors and steam turbines are not specifically listed and approved.

Internal-combustion engines (gasoline or diesel) approved as indicated in the listings. The usable power represents the power available to drive the pump. Allowance has been made for engine wear, accessories and manufacturing tolerances as covered in Factory Mutual installation standards.

FIRE-PUMP DRIVERS, Gasoline-engine

Chrysler Corp Detroit Mich

Industrial Model 23-1063. Usable power 60 hp at 1750 rpm, 84 hp at 2400 rpm, 90 hp at 2800 rpm (max. recommended).

Industrial Model 58A-1104. Usable power 95 hp at 1750 rpm, 123 hp at 2400 rpm, 140 hp at 3200 rpm (max. recommended).

Continental Motors Corp Muskegon Mich

Model F-244. Usable power 58 hp at 1750 rpm, 76 hp at 2400 rpm, 86 hp at 3000 rpm (max. recommended).

Model M-330. Usable power 77 hp at 1750 rpm, 98 hp at 2400 rpm, 102 hp at 2800 rpm (max. recommended).

Model M-363. Usable power 83 hp at 1750 rpm, 110 hp at 2500 rpm, 121 hp at 3000 rpm (max. recommended).

Model R-427. Usable power 93 hp at 1750 rpm, 118 hp at 2400 rpm, 125 hp at 2800 rpm (max. recommended).

Model R-602. Usable power 130 hp at 1750 rpm, 160 hp at 2400 rpm, 164 hp at 2600 rpm (max. recommended).

Model S-820. Usable power 166 hp at 1750 rpm, 185 hp at 2000 rpm, 197 hp at 2200 rpm (max. recommended).

Hercules Motors Corp Canton O

Model H X E. Usable power 179 hp at 1750 rpm, 198 hp at 2000 rpm.

Waukesha Motor Co Waukesha Wis

Model H-570. Usable power 140 hp at 1750 rpm, 169 hp at 2200 rpm, 187 hp at 2600 rpm (max. recommended).

Model H-884. Usable power 216 hp at 1750 rpm, 226 hp at 1800 rpm (max. recommended).

Model 145-GZU. Usable power 170 hp at 1750 rpm, 174 hp at 1800 rpm (max. recommended).

Model WAKCU. Usable power 232 hp at 1750 rpm, 238 hp at 1800 rpm (max. recommended).

FIRE-PUMP DRIVERS, Diesel-engine

Cummins Engine Co Inc Columbus Ind

Model H-6-IF. Usable power 130 hp at 1750 rpm, 132 hp at 1800 rpm (max. recommended).

Model NHS-6-IF. Usable power 213 hp at 1750 rpm, 220 hp at 2100 rpm (max. recommended).

General Motors Corp Detroit Diesel Engine Div Detroit Mich

Model 3061-AZ. Usable power 86 hp at 1750 rpm.

Model 4061-AZ. Usable power 119 hp at 1750 rpm.

Model 6061-AZ. Usable power 177 hp at 1750 rpm.

Model 62407-RD. Usable power 295 hp at 1800 rpm.

Hercules Motors Corp Canton O

Model DFXH. Usable power 193 hp at 1750 rpm, 211 hp at 2000 rpm (max. recommended).

RIGHT-ANGLE GEAR DRIVES

Gear drives are used to transmit power from horizontal engine shafts to vertical pumps.

Practically all vertical-shaft fire pumps presently

factured have a rated speed of approximately rpm. Internal-combustion engines are approved proximate speeds ranging from 1750 to 3200 rpm. equently speed-decreasing ratios and 1:1 gear will normally be employed. Other gear ratios itable and may be used when pumps and engines ring said gears become available.

sable horsepower in the listings represents maximum power that may be transmitted at 1760 rpm al-shaft speed. These loads should not be ex- ed. Gears shall have a usable horsepower equal greater than the maximum pump horsepower.

or any vertical-shaft speed, the horsepower rating any model is the same for all gear ratios. At other ical-shaft speeds the usable horsepower rating will different.

Gear & Mfg Co Ltd Berkeley 10 Cal

Usable power	Vert. shaft speed rpm	Horizontal shaft, speed increasing ratios Driver: Driven 1:2	4:7	2:3	3:4	4:5	5:6	1:1
10	1760	880	1015	1173	1320			1760
10	1760	880	1012	1173	1320		1457	1760
40	1760	880	1012	1173	1320		1457	1760
60	1760	880	1012	1173	1320		1457	1760
60	1760	880	1008	1173	1320	1419	1457	1760
100	1760	880	1001	1173	1320	1418	1457	1760
125	1760	883	1001	1173	1320	1417	1458	1760
175	1760	883	1010	1173	1320	1400	1458	1760
225	1760	883	1010	1173	1320		1460	1760
225	1760		1010	1186	1310		1460	1760
300	1760	883	1010	1186	1310		1460	1760
400	1760	883	1000	1185	1310		1473	1760

		Horizontal shaft, speed decreasing ratios Driver: Driven 6:5	5:4	4:3	3:2	7:4	2:1	9:4
10	1760			2347	3040	3067	3520	
30	1760	2127		2347	3040	3061	3520	
40	1760	2127		2347	3040	3061	3520	
60	1760	2127		2347	3040	3061	3520	
60	1760	2127	2182	2347	3040	3061	3520	
100	1760	2127	2182	2347	3040	3080	3520	
175	1760	2127	2185	2347	3040	3095	3520	3939
225	1760	2134	2187	2347	3040	3095	3520	3939
300	1760	2124	2187	2347	3040	3095	3520	3962
300	1760	2122		2365	2612	3095	3568	3920
400	1760	2122		2365	2612	3095	3568	

Pump Hydrodynamics Div FMC Corp 2005 North- Ave Indianapolis 8 Ind

	Horizontal shaft, speed increasing ratios Driver: Driven 1:2	4:7	2:3	3:4	4:5	5:6	1:1
75	1760		1173	1320		1457	1760
125	1760		1173	1320		1457	1760
150	1760	880	1173	1320			1760
200	1760	880	1000	1173	1320		1760
300	1760	880	1000	1173	1320		

	Horizontal shaft, speed decreasing ratios Driver: Driven 6:5	5:4	4:3	3:2	7:4	2:1	9:4
75	1760	2127		2347			
125	1760	2127		2347			
150	1760						
200	1760						
300	1760						

PLACEMENT RUBBER DISCS for Steam Fire Pumps

Standard Underwriter steam fire pumps are no longer manufactured, but many continue to give excellent service. This is a direct-acting duplex pump with all important moving parts and bearings of bronze.

Replacement rubber discs for valves in Underwriter steam fire pumps may be obtained from:

Elkhart Rubber Works Elkhart Ind

FIRE-PUMP CONTROLLERS

Controllers for electric-motor-driven fire pumps as listed are for alternating-current squirrel-cage motors unless indicated as for slip-ring motors. They are available for manual operation alone or for combined manual and automatic operation. Controllers for squirrel-cage motors are approved for 3-phase and 2-phase power except as noted; and are of two types, across-the-line and primary-resistance reduced-voltage.

Across-the-line starting is preferred and recommended. Where power is purchased, consult the utility company to make sure that across-the-line starting will be acceptable to them.

Approved controllers are available for all standard voltages up to 600 except as indicated. Voltages above 600 are not recommended for fire-pump service.

All controller assemblies include approved and acceptable standard electrical devices. An approved controller is a complete, assembled unit, wired and tested, ready for immediate service by connecting to power supply and proper motor terminals.

The approved timer furnished with automatic controllers should be set to keep the motor running one minute for each 10 h.p. up to a maximum of seven minutes to prevent overheating stator winding by too frequent starting, as would occur with small leaks or small drafts from the fire-service system. For example, 50 h.p., five minutes; 100 h.p., seven minutes.

The following information should be supplied to the manufacturer with the purchase order, and a copy should be forwarded to the Insurance Company.

1. Complete motor nameplate data.
2. Motor suitable for across-the-line starting?
3. One or two power sources? (Switch to be mounted in the starter will be either single-throw or double-throw.)
4. Complete data of power source(s). How installed. How protected. Transformers. Rating. Reactance or impedance if available. Short circuit current on low-voltage side of transformer or at main bus.
5. Feeder supply to starter and motor. Length and size of cable. How installed. How protected.
6. Do local regulations require undervoltage protection? (Required by the Factory Mutuals on reduced-voltage-type controllers only.)

Standards of the Factory Mutual Engineering Division require that "the interrupting rating of the circuit breaker be adequate for the circuit in which it is to be used, and not less than 15,000 amperes in any case."

Canadian Controllers Ltd 1550 Birchmount Rd Scarborough Ont

Bulletin No. 10620. Manual. Across-the-line type.

Bulletin No. 10640. Manual. Reduced-voltage type.

Bulletin No. 10630. Combined manual and automatic. Across-the-line type.

Bulletin No. 10650. Combined manual and automatic. Reduced-voltage type.

Clark Controller Co 1146 E 152nd St Cleveland O
Bulletin Nos. 10620 and 10625 (the latter for 2-phase, 550-volt service). Manual. Across-the-line type.
Bulletin Nos. 10640 and 10645 (the latter for 2-phase, 550-volt service). Manual. Reduced-voltage type.
Bulletin Nos. 10630 and 10635 (the latter for 2-phase, 550-volt service). Combined manual and automatic. Across-the-line type.
Bulletin Nos. 10650 and 10655 (the latter for 2-phase, 550-volt service). Combined manual and automatic. Reduced-voltage type.

Cutler-Hammer Inc 315 N 12th St Milwaukee Wis
Bulletin Nos. 12010H and 12010HA. Manual. Across-the-line type. Approved in 3-phase design only.
Bulletin Nos. 12015H and 12015HA. Manual. Reduced-voltage type. Approved in 3-phase design only.
Bulletin Nos. 12030H and 12030HA. Combined manual and automatic. Across-the-line type. Approved in 3-phase design only.
Bulletin Nos. 12035H and 12035HA. Combined manual and automatic. Reduced-voltage type. Approved in 3-phase design only.

Cutler-Hammer Canada Ltd 45 Progress Av Scarborough Ont
Bulletin No. 12010H. Manual. Across-the-line type. Approved in 3-phase design only.
Bulletin No. 12015H. Manual. Reduced-voltage type. Approved in 3-phase design only.
Bulletin No. 12030H. Combined manual and automatic. Across-the-line type. Approved in 3-phase design only.
Bulletin No. 12035H. Combined manual and automatic. Reduced-voltage type. Approved in 3-phase design only.

G & N Engineering Co Switchgear Div of Sandman Electric Co Inc 660 Parker St Boston 20 Mass
Factory Mutual designed and engineered controller FM-3. Manual. Across-the-line type.
Factory Mutual designed and engineered controller FM-2. Combined manual and automatic. Across-the-line type.

Lexington Electric Products Co Inc 12 Chapel St Newark 5 N J
Bulletin No. LX-1024. Manual. Across-the-line type.
Bulletin No. LX-1041. Manual. Reduced-voltage type.
Bulletin No. LX-1023. Combined manual and automatic. Across-the-line type.
Bulletin No. LX-1040. Combined manual and automatic. Reduced-voltage type.
Bulletin No. LX-1025. Manual. For slip-ring motors.
Bulletin No. LX-1030. Combined manual and automatic. For slip-ring motors.

Westinghouse Electric Corp Buffalo 5 N Y
Class 11-820. Combined manual and automatic. Across-the-line type.

FIRE-PUMP CONTROLLERS, Modified, for Limited-service Pumps

Modified controllers for limited-service electric-motor-driven fire pumps are approved as listed below. They are of the combined manual and automatic type and are designed for squirrel-cage induction motors driving pumps for limited-service applications such as in boosting low supply-system pressures. They are not intended for use as standard fire-pump controllers. The circuit breaker provided is of the thermal-element type and has a current-interrupting rating adequate for the circuit in which it is to be employed but not less than 10,000 amperes. No disconnecting switch other than the controller's circuit breaker is furnished. These controllers may be used as automatic controllers for 3-phase, 60 cycle, across-the-line type squirrel-cage motors rated at 30 hp or less, 600 volts or less.

Clark Controller Co 1146 E 152nd St Cleveland 10 O
Bulletin No. 10663. Can be arranged for: automatic start, automatic stop; automatic start, manual stop; or manual start, manual stop.

G & N Engineering Co Switchgear Div of Sandman Electric Co 660 Parker St Boston 20 Mass
Model FM-4. Combined manual and automatic.

Kolok Co Norwood Mass
Model FP. Combined manual and automatic.

Lexington Electric Products Co Inc 12 Chapel St Newark 5 N J
Bulletin No. LX-1052-A. Automatic start and stop.
Bulletin No. LX-1052-B. Automatic start and continuous running.

FIRE-PUMP CONTROLLERS, for Gasoline or Diesel-driven Pumps

Controllers for internal-combustion-engine-driven fire pumps provide an automatic means for starting either approved gasoline- or diesel-engine-driven centrifugal fire-pump units. The controllers are approved only for use where the fire pump takes suction under head. They provide for automatic standby service where electric or steam supplies are not reliable for driving fire pumps, and they are not intended for installation of primary fire protection. The installation should be undertaken only by a representative of the manufacturer.

Custom Built Controls Inc 775 Sheridan Blvd Denver 14 Col
Models FPCF, FPDF. 6, 12, 24, 32v.

King-Knight Co 360 Jefferson St San Francisco Cal
Model FP-59 (6, 12, 24v). Gasoline or diesel engine.

Synchro-Start Products Inc 8151 N Ridgeway Av Skokie Ill
Universal Controller. Models DU (diesel), GU (gasoline) 6, 12, 24, 32v.

PUMP-SUCTION TANKS

The pump-suction tanks listed show standard sizes in U. S. gallons and conform to current specifications for water tanks. It is recommended that standard sizes be used wherever possible. The listed manufacturers are equipped to design and furnish special tank structures conforming to Factory Mutual specifications if required for unusual yard conditions. Approved wooden suction tanks may be obtained from manufacturers listed under "Gravity Tanks, Wooden."

American Boiler & Tank Co 2720-2760 Hillock Av Chicago 8 Ill
150,000 gallons.

Buffalo Tank Div Bethlehem Steel Co Dunellen N J
100,000, 150,000, 200,000, 300,000 gallons.

...Caldwell Co Inc Louisville 8 Ky
...150,000, 250,000, 300,000 gallons.
...Bridge & Iron Co 1305 W 105th St Chicago Ill
...150,000, 200,000 gallons.
...Mfg Co Newnan Ga
...75,000, 100,000, 125,000, 150,000, 200,000, 250,000,
...400,000, 500,000 gallons.
...Tank Co Third & Booth Sts Chester Pa
...150,000, 200,000, 250,000, 300,000 gallons.
...Tank & Mfg Co D. Union Tank Car Co 111 W Jackson
...Chicago 4 Ill
...150,000, 200,000, 250,000, 300,000 gallons.
...Steel Works Ltd 188 Jenet St Port Erie Ont
...150,000, 200,000 gallons.
...Manufacturing Co 973 N Main St Los Angeles Cal
...200,000, 500,000 gallons.
...Tank & Mfg Co Inc 8201 Santa Fe Av Los Angeles 1 Cal
...150,000, 200,000, 250,000 gallons.
...Corporation 1400 S Third St St Louis 66 Mo
...125,000, 150,000, 175,000, 200,000, 250,000, 300,000
...-Des Moines Steel Co Neville Island P O Pittsburgh
...75,000, 100,000, 125,000, 150,000, 175,000, 200,000
...Iron Works & Supply Co Macon Ga
...200,000 gallons.

...OT VALVES

...valves are used at the inlet of suction pipes for ...pumps taking water under a lift. They are a special ...of check valve which facilitates priming of centrif... fire pumps by holding the water in the suction ...

...Pumps Div of Buffalo Forge Co Buffalo 5 N Y
...Corp Harrison N J

...ATER-RELIEF VALVES

A water-relief valve is designed to relieve excessive ...ures in a water supply system. It is also used in the ...harge line of a fire pump to limit the pressure de... by the pump. The valve has a disc held closed ...a compressed helical spring. An adjusting screw and ...dwheel are used to regulate the pressure-relief setting. ...n pressures act on the disc, compress the spring, and ...e water passes through the valve and is discharged to ...osphere.

Approval specifications require that a valve, set to ...erate at 100 pounds, will discharge the full rated ...p capacity without permitting the pressure to rise ...ove 125 pounds. It is designed to permit the removal ...f all working parts without removing the valve from ...pipe connections. Sufficient clearance of all moving ...ts prevents sticking and avoids faulty operation.

Following are the standard sizes of relief valves: if pump rating is 500 gpm, use a three-inch valve; if 750 gpm, use three-and-a-half-inch; if 1,000 gpm, use four-inch; 1,500 gpm, five-inch; 2,000 gpm, six-inch.

Ashton Valve Co 43 Kendrick St Wrentham Mass
No. 21.

Farris Engineering Corp Palisades Park N J
Type 1467. 3, 3½, 4, 5, 6 in. 250 lb inlet and 125 lb outlet. Flanged connections.
Type 1476. 3, 4 in. 250 lb inlet flanged connection and female screw outlet.

Kunkle Valve Co Fort Wayne Ind
Figs. 218, 218-CS-164. 3, 3½, 4, 5, 6 in.

LeCourtenay Co 5 Main St Newark N J
Suitable for centrifugal pumps only.

J E Lonergan Co Second & Race Sts Philadelphia 6 Pa
Models HU and HU-D. 3, 3½, 4, 5, 6 in.

Manning Maxwell & Moore Inc Bridgeport Conn

GRAVITY TANKS

The common type of elevated storage tank for industrial plants is either a steel or a wooden tank supported by a steel tower, located either on the ground or on the roof of a building. Small tanks are supported directly by elevator or stair towers extending above the main roofs of buildings.

The approved tank-and-tower units conform to the current specifications for gravity water tanks and steel towers. Capacities of steel tanks range from 25,000 to 300,000 gallons, and of wooden tanks, from 25,000 to 75,000 gallons. Some manufacturers make other sizes. The most common height of towers for ground-supported tanks is 100 feet, measured vertically from foundations to bottom capacity line.

For economy and to avoid delay in developing and obtaining approval of special designs, it is recommended that standard sizes of tank structures be used wherever possible. When unusual yard conditions prevent the use of a standard structure, or when the tank must be located on a building, the manufacturers listed are equipped to design and furnish special tank structures conforming to Factory Mutual specifications.

In the listings that follow, tank capacities are in U. S. gallons and tower heights are to the bottom capacity line.

GRAVITY TANKS, Steel, on Steel Towers

W E Caldwell Co Inc Louisville 8 Ky
25,000, 30,000, 40,000, 50,000, 60,000, 75,000, 100,000 gallons. Towers 50, 75, 100, 125 ft.

Chicago Bridge and Iron Co 1305 W 105th St Chicago Ill
40,000, 50,000, 60,000, 75,000, 100,000, 125,000, 150,000 gallons. Towers 50, 75, 100, 125 ft.

R D Cole Mfg Co Newnan Ga
50,000 gallons. Towers 75, 100 ft.
75,000, 100,000 gallons. Towers 100, 125 ft.

Graver Tank & Mfg Co Div Union Tank Car Co 111 W Jackson Blvd Chicago 4 Ill
50,000, 75,000, 100,000, 150,000 gallons. Towers 50, 75, 100, 125 ft.

Horton Steel Works Ltd 188 Janet St Fort Erie Ont
40,000, 50,000, 60,000, 75,000, 100,000, 125,000, 150,000 gallons. Towers 50, 75, 100, 125 ft.

Nooter Corporation 1400 S Third St St Louis 66 Mo
50,000 gallons. Towers 50, 75, 100 ft.
75,000, 200,000 gallons. Towers 50, 75, 100, 125 ft.
300,000 gallons. Tower 100 ft.

Pittsburgh-Des Moines Steel Co Neville Island P O Pittsburgh Pa
25,000, 30,000 gallons. Towers 50, 75, 100 ft.
40,000, 50,000, 60,000, 75,000, 100,000 gallons. Towers 50, 75, 100, 125 ft.
125,000 gallons. Tower 100 ft.
150,000 gallons. Towers 50, 100, 125 ft.

Taylor Iron Works & Supply Co Macon Ga
30,000 gallons. Tower 75 ft.
50,000, 75,000 gallons. Towers 75, 100 ft.
125,000 gallons. Tower 125 ft.

GRAVITY TANKS, Wood or Steel Towers

W E Caldwell Co Inc Louisville 8 Ky
40,000 gallons. Tower 75 ft.
50,000, 60,000 gallons. Tower 100 ft.

Wendnagel & Co Inc 600 W Cermak Rd Chicago 16 Ill
50,000 gallons. Towers 70, 100 ft.
60,000 gallons. Tower 50 ft.
75,000 gallons. Tower 100 ft.

GRAVITY TANKS, Wood, Without Towers

Wooden tanks without towers can be furnished by the manufacturers listed, for replacement of tanks on steel towers, or where they are to be supported on steel beams on top of stair or elevator towers above building roofs.

Acme Wood Tank Co Inc 906 Summit Av Jersey City 6 N J

Ajax Tank and Tower Co 1440 N Fremont St Chicago Ill

Atlantic Tank Corp 1207-1267 Tonnele Av North Bergen N J

W E Caldwell Co Inc Louisville 8 Ky

Canada Barrels and Kegs Ltd Waterloo Ont

Chicago Wooden Tank Co 2637 S Throop St Chicago 8 Ill
With aluminised steel dome roofs.

Hall-Woolford Wood Tank Co 5500 N Water St Philadelphia 20 Pa

David Isseks and Son 230 Kent St Brooklyn N Y

Johnson and Carlson 848-864 Eastman St Chicago Ill

Mayer Tank Mfg Co Inc 264-72 N Henry St Brooklyn N Y

Rosenwach Tank Co Inc 96 North Ninth St Brooklyn 11 N Y

Ernest Roth & Sons Chaltanham Pa

A T Stearns Lumber Co Neponset Mass

Wendnagel & Co Inc 600 West Cermak Rd Chicago Ill
With aluminum dome roofs.

Wennels Tank Co 39 Cortlandt St New York N Y

GRAVITY TANKS and Towers, Special Design

All manufacturers of approved tanks are equipped to furnish specially designed wooden or steel tanks and towers for roofs of buildings in accordance with Factory Mutual specifications.

GRAVITY TANKS, Corrosion Prevention

In cathodic protection, electrodes are suspended in the tank water, a rectifier is mounted near the tank, the tower, standpipe or pump suction tank and a protective wire is run from the power unit to the electrodes. The electrodes are insulated from the tank. The tank is properly grounded, making a complete circuit. These systems prevent corrosion inside the tank below the water level, and thus periodic repainting of this portion of the interior is unnecessary when equipment is properly installed and maintained. Electrodes are usually installed by manufacturer without draining the tank. Both aluminum and high silicon electrodes are available. New and existing installations should incorporate a system to allow complete recovery of either type. The meter readings in the rectifier cabinet should be checked on a weekly schedule to make sure they agree with the recommended readings so that adequate protection will be provided. Fire-protection tanks must be kept free of ice.

Electro Rust-Proofing Corp 30 Main St Belleville 9 N J
Rustop System of Cathodic Protection.

Harco Corporation Cathodic Protection Div 4600 E 71st Cleveland 25 O
Electrical method of rust prevention using suspended electrodes.

Wallace & Tiernan Ltd 925 Warden Av Scarborough Ont
Rustop System of Cathodic Protection.

GRAVITY-TANK HEATERS

Reliable, adequate-sized water heaters for elevated tanks are of utmost importance to prevent the formation of ice in riser and tank, resulting in plugging the riser and possible structural damage.

In general, the heating system should be able to maintain the temperature of the water at 42° F., or slightly above, during coldest weather. The water temperature is indicated by a thermometer in the circulating pipe near the heater inlet.

All of the heaters described below are of the gravity circulating type in which cold water from the base of the riser passes through the heater and rises through an independent pipe up into the tank. This arrangement permits convenient observation of coldest water temperature and has proved dependable and economical where properly installed.

Steel tank on steel tower.

Wooden tank on steel tower.

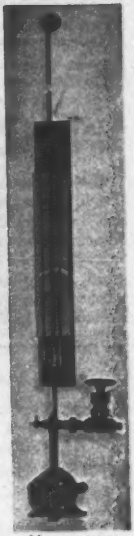
Pump-suction tank.

Constant-pressure limited-water-supply tank.

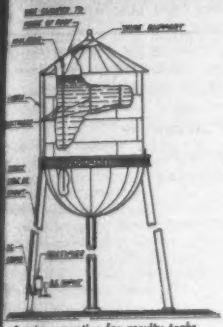
Wooden tank without tower.

Tank heater, gas burning.

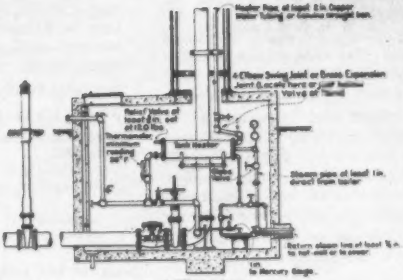
Tank heater, coal burning.



Mercury gage.



Corsican provocation for gravity tanks.



Tank heater, steam.

GRAVITY-TANK HEATERS, Steam

Steam tank heaters usually consist of a cast-iron or steel shell through which water circulates by gravity around brass or copper steam tubes or coils. This is the most common method of tank heating and is suitable where an ample steam supply can be obtained from plant boilers. The combination of an independent, automatically controlled gas- or oil-burning boiler and a steam tank heater is not advised because of complications with pressure controls. The following heaters are designed for water pressures up to 150 psi in the heater shell.

W E Caldwell Co Inc Louisville 8 Ky

Central Automatic Sprinkler Co Inc Fourth St & Cannon Av Lansdale Pa

R D Cole Mfg Co Newnan Ga

Horton Steel Works Ltd 188 Janet St Fort Erie Ont
Sizes 3A, 4A, 5A, 6A.

Patterson-Kelley Co Inc East Stroudsburg Pa
Type DG. Series 200.

GRAVITY-TANK HEATERS, Coal-, Oil-, or Gas-burning

These heaters are arranged so that water circulates through a chamber, series of chambers, or through brass pipe coils around and over the fire. Unless otherwise noted, the heaters are designed for water pressures up to 120 psi in order to be suitable for working pressures resulting from tanks on high towers. Nearly all heater manufacturers can also provide heaters for water pressures up to 30 psi for low tank structures.

H B Smith Co Westfield Mass
Hy-Test Boilers. No. 17 (140 lb working pressure). No. 24 (120 lb working pressure). Nos. 34, 44 (80 lb working pressure).

GRAVITY-TANK HEATERS, Gas-burning

These heaters are designed for use with natural gas, manufactured gas, mixtures of these gases or with LP-gas as noted in the approval report. Water passes through a copper coil which is exposed to the gas flame. The heater is designed for automatic operation. All necessary burner safeguards, temperature controls, and a water-pressure relief valve are provided with the heater. The copper coils are tested for 350 psi pressure.

Rund Mfg Co 2025 Factory St Kalamazoo 347 Mich
Multicoil Heaters. Nos. 300A, 500A.

CONSTANT-PRESSURE TANK, Limited Water Supply

The automatic limited water supply system provides protection for isolated hazards where no other supply is available. It consists of a closed water tank in which pressure is constantly maintained for the tank capacity by a pressure-regulated discharge from a gas supply.

Grinnell Corp Providence 1 R I
Selfcon Limited Water Supply. Automatic constant pressure.

MERCURY GAGES

Indicates the water level in sprinkler tanks. A mercury column balances the water pressure from the tank. The gage must be located in a heated room and connected to the tank discharge pipe on the tank side of the tank check valve. The height of mercury column needed is usually considerable. When ordering, state the vertical distance from tank water level to gage. The gage comes equipped with a two- or three-foot pipe extension at the top of the gage glass unless there may be fluctuating water pressure, in which case a mercury catcher at the top of the gage glass can be ordered extra.

W E Caldwell Co Inc Louisville 8 Ky

R D Cole Mfg Co Newnan Ga

Grinnell Corp Providence 1 R I
Fig. 1358.

PORTABLE EXTINGUISHERS

...P TANKS

...Pump tanks are covered containers, usually cylindri... provided with a double action pump, discharging ...ough a short length of hose and nozzle. The tank is ...d through a removable cap in the top.

They are recommended for fires in ordinary com...tible materials such as paper, wood, textile fibers, ..., where a wetting and cooling extinguishing agent ...equired. Where freezing is likely, water can be ...ed with an antifreeze solution prepared from a ...p furnished by the manufacturer and specified on ...e extinguisher nameplate.

...ation Mfg Co 600 S 25th Av Bellwood Ill
...dm. 2½ 5 gal.

...erican LaFrance Elmira N Y
...erican LaFrance. Models 250 (3½ gal), 500 (5 gal)

...ard Chemical Co Fire Equipment Div Marinette Wis
...ard. Models WPS-2½ (2½ gal steel), WPC-2½ (2½ gal ...per), WPS-5 (5 gal steel), WPC-5 (5 gal copper).

...ard Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor) ...W Vaughan Rd Toronto 10 Ont
...ard. Models WPS-2½ (2½ gal steel), WPC-2½ (2½ gal ...per), WPS-5 (5 gal steel), WPC-5 (5 gal copper).

...ch & Goodhue 2898 San Pablo Av Berkeley 2 Cal
...Knockman. 2½ gal.

...Brass Mfg Co 1302 W Beardsley Av Elkhart Ind
...Elkart. Models PB2½ (2½ gal steel), PC2½ (2½ gal copper), ...5 (5 gal steel), PC5 (5 gal copper).

...Guard Corp 1685 Shermer Rd Northbrook Ill
...Fire Guard. Models PT2½S (2½ gal steel), PT2½C (2½ gal ...per), PT5S (5 gal steel), PT5C (5 gal copper).

...-Pyrar Co 221 Canse St Dayton 1 O
...Fy-Pyrar. Models 43-6 (2½ gal steel), 60-6 (5 gal steel).
...Fy-Pyrar. Models C-42-6 (2½ gal copper shell), C-60-6 (5 gal ...per shell). Antifreeze charge.
...Ideia. Models 42-7 (2½ gal steel), 60-7 (5 gal steel).
...Ideia Better Built. Models C-42-7 (2½ gal copper shell), ...0-7 (5 gal copper shell). Antifreeze charge.
...Pyrene. Models T2S-2 (2½ gal steel), T1S-2 (5 gal steel).
...Pyrene. Models T-2S-2 (2½ gal copper shell), T-1S-2 (5 gal ...per shell). Antifreeze charge.

...General Fire Extinguisher Corp 4444 W. Irving Park Rd Chi...cago 41 Ill
...General Quick Aid. Models A-704S (2½ gal steel), A-704C (2½ gal copper), P-900S (5 gal steel), P-900C (5 gal copper).

...General Fire Extinguisher Corp (Canada Ltd) 978 St Luke Rd ...Windsor Ont
...General Quick Aid Fire Guard. Models A-704 (2½ gal), ...P-900 (5 gal).

...Water Kidde & Co Inc 675 Main St Belleville N J
...Kidde. Models PTG-2½ (2½ gal), PTG-5 (5 gal). Steel or ...copper.

Lofstrand Co Rockville Md
Lofstrand. Models D-351-A (2½ gal steel), D-351-AC (2½ gal copper), D-351-F (4 gal steel), D-351-FC (4 gal copper), D-351-B (5 gal steel), D-351-BC (5 gal copper).

Miller-Pocrious Mfg Co 452 N Sangamon St Chicago Ill
Miller. Models EX-317 (2½ gal copper or steel), EX-746 (5 gal copper or steel).

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Models 280A (2½ gal), 281A (5 gal).

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto Ont
Pyrene. 2½, 5 gal. Copper.
Pyrene. 2½, 5 gal. Steel.

Sears Roebuck & Co 925 S Homan Av Chicago Ill
Allstate. Models 6585 (2½ gal), 6586 (5 gal).

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich
Seco. 5 gal. Steel.

D B Smith & Co Inc Main St Utica N Y
Omnia. Model 42-4 (2½ gal).
Arrow. Model 60-5 (5 gal).
Indian Back Pack. Model 90G (5 gal).

FIRE PAILS

The most practical fire pail is of 24 U.S. gage galvanized iron with flat bottom, holding 12 quarts, and provided with a loose-fitting cover to keep out lint and dirt, and retard evaporation. Fire pails should be painted bright red outside, with "FIRE" in large letters to attract attention. If calcium chloride antifreeze solution is used, pails should be coated inside, first with red lead and oil, then with asphalt-base paint.

The number of pails needed is influenced by the character of the occupancy, but one fire pail for every 750 sq. ft. of floor area is a good general rule. No point within the protected area should be farther than 35 ft. from a pail. Where there is more than ordinary hazard, groups of three to five pails should be provided.

For use where freezing is likely, water can be replaced with calcium chloride solution as follows:

Freezing point, °F	*80% Flake $CaCl_2$*, lb/gal of water.*	*Specific gravity at 60° F*
0	2.83	1.183
—10	3.36	1.213
—20	3.89	1.237
—30	4.37	1.258
—40	4.73	1.274
—50	4.94	1.283

*Use fire-protection grade which is free from magnesium chloride and other impurities.

WATER-FILLED EXTINGUISHERS

Water-filled extinguishers contain 2½ gallons of water which is expelled by stored air pressure, or by carbon dioxide released from a gas cartridge at the time of use.

The stored-pressure type unit is operated by means of a seat-type valve on the extinguisher. The gas-cartridge type extinguisher is operated by depressing a lever, striking a knob, or by inverting the extinguisher and bumping it on the floor.

These extinguishers are suitable for fires in ordinary combustibles such as wood, paper, textile fibers, etc. They are not recommended for fires in oils, greases, paints, flammable liquids, etc.; for fires involving live electrical equipment; or for fires in metals such as magnesium, powdered aluminum, sodium or potassium.

American LaFrance Elmira N Y

American LaFrance. Model 3H2. 2½ gal. Stainless steel shell.
American LaFrance. Model PCW-2½. 2½ gal. Stored-pressure type. Stainless steel shell.

Ansul Chemical Co Fire Equipment Div Marinette Wis

Ansul. Model WS-2½. 2½ gal. Stored-pressure type. Stainless steel shell.

Ansul Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor) 747 Vaughan Rd Toronto 10 Ont

Ansul. Model WS-2½. 2½ gal. Stored-pressure type. Stainless steel shell.

Badger Fire Extinguisher Co Chase St Methuen Mass

Badger's. 2½ gal.
Badger's. 2½ gal. Drawn brass shell.
Badger's Nautilus. 2½ gal. Drawn brass shell. With disposable cartridge.
Badger's Nautilus. 2½ gal. Stainless steel shell. With disposable cartridge.
Alrex. 2½ gal. Stored-pressure type. Stainless steel shell.

Croker Fire Prevention Div of Fire End & Croker Corp 656 Gerard Av New York 51 N Y

Chief Croker. 2½ gal. Stainless steel shell.
Chief Croker. 2½ gal.

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind

Elkhart. Model X. 2½ gal. Drawn brass shell.
Elkhart. Model EASH. 2½ gal. Stored-pressure type. Stainless steel shell.
Elkhart. Model EASS. 2½ gal. Stored-pressure type. Stainless steel shell.
Elkhart. Model X-S. 2½ gal. Stainless steel shell.
Elkhart. Model EA. 2½ gal. Stored-pressure type. Drawn brass shell.

Fire Guard Corp 1685 Shermer Rd Northbrook Ill

Fire Guard. Model W12. 2½ gal. Stainless steel shell.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Fyr-Fyter. Model 94-14-A. 2½ gal. Stainless steel shell.
Fyr-Fyter. Model 94-23. 2½ gal. Stored-pressure type. Stainless steel shell.
Buffalo Better Built. Model 94-17-A. 2½ gal. Stainless steel shell.
Buffalo Better Built. Model 94-24. 2½ gal. Stored-pressure type. Stainless steel shell.
Pyrene. 2½ gal. Stainless steel shell.
Pyrene. Models HW12, HW12-1-A. 2½ gal. Stainless steel shell.
Pyrene. Model HW-12P. 2½ gal. Stored-pressure type. Stainless steel shell.

Fyr-Fyter Co of Canada Ltd 136 Manitoba St Toronto Ont

Fyr-Fyter. Model 94-23. 2½ gal. Stored-pressure type.
Buffalo. Model 94-24. 2½ gal. Stored-pressure type.
Fyr-Fyter. Model 94-14. 2½ gal. Cartridge operated.
Buffalo. Model 94-17. 2½ gal. Cartridge operated.

General Air Products Corp 5345 N Keddie Av Chicago 25 Ill

Gapco. 2½ gal.

General Fire Extinguisher Corp 9740 Washington Blvd Culver City Cal

General Quick-Aid Fire Guard. Model WC-400. 2½ gal.
General Quick-Aid Fire Guard. Model IB-500. 2½ gal. Drawn brass shell.
General Quick-Aid Fire Guard. Models IW-500, WW-500, 2½ gal. Stainless steel shell.
General Quick-Aid Fire Guard. Models WS-500, WS-700, 2½ gal. Stored-pressure type. Stainless steel shell.

General Fire Extinguisher Corp (Canada Ltd) 970 St Luke Rd Windsor Ont

General Quick-Aid Fire Guard. Model WC-400. 2½ gal.
General Quick-Aid Fire Guard. Model IP-500. 2½ gal. Drawn brass shell.
General Quick-Aid Fire Guard. Models IW-500, WW-500, 2½ gal. Stainless steel shell.
General Quick-Aid Fire Guard. Models WS-500, WS-700, 2½ gal. Stored-pressure type. Stainless steel shell.

Walter Kidde & Co Inc 675 Main St Belleville 9 J

Kidde. Model WABS-B. 2½ gal. Stored-pressure type. Drawn brass shell.
Kidde. Model WBG. 2½ gal. Stainless steel shell.
Kidde. Model WPBK. 2½ gal. Stored-pressure type. Stainless steel shell.
Kidde. Model KWM. 2½ gal. Silicon bronze.

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto 8 Ont

Pyrene. 2½ gal. Stainless steel shell.

Randolph Laboratories Inc 1450 Frontage Rd Northbrook Ill

Randolph. Model 17788. 2½ gal. Stored-pressure type. Stainless steel shell.
Randolph. Model 1770. 2½ gal. Stainless steel shell.

Safety First Products Corp 175 Saw Mill River Rd Elmsford N Y

Nu-Swift Universal. Model E1076. 2½ gal.

Schwartz Bros Inc 827 Arch St Philadelphia 7 Pa

SOS Defender. Model SRJ-50. 2½ gal.

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich

Seco. Model 26-SSA. 2½ gal. Stainless steel shell.
Seco. Models 28-SSA, 28-SSA. 2½ gal. Stored-pressure type. Stainless steel shell.

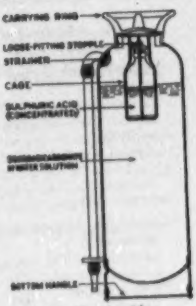
Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Sons Jasper & York Sts Philadelphia 25 Pa

Stempel. Model WS-700. 2½ gal. Stored-pressure type. Stainless steel shell.

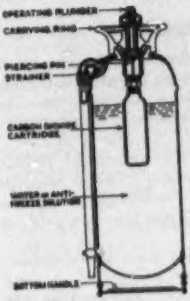
Stop-Fire Inc U S Highway No 1 New Brunswick N J

Stop-Fire. Model WC-50. 2½ gal.
Stop-Fire Redi-Jet. Models RJ-50-A, RJ-50-B. 2½ gal. Stored-pressure type.
Stop-Fire Redi-Jet. Model SRJ-50. 2½ gal. Stored-pressure type. Stainless steel shell.

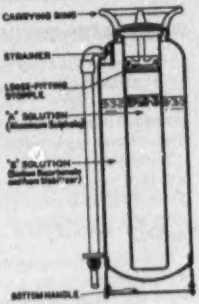
Pump tank.



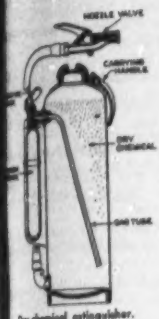
Soda-acid extinguisher.



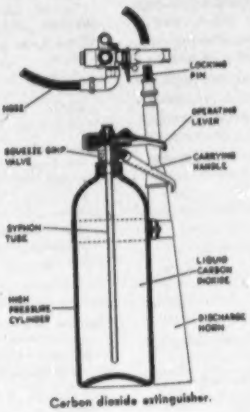
Water-filled (or antifreeze) extinguisher.



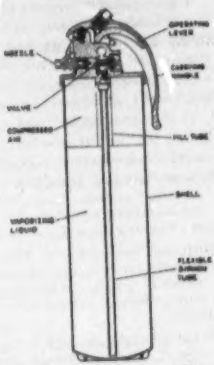
Foam extinguisher.



Dry-chemical extinguisher.

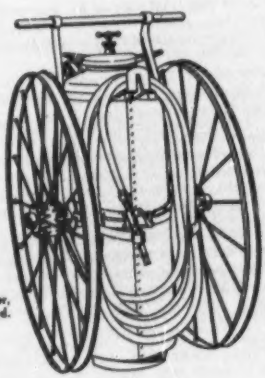


Carbon dioxide extinguisher.



Vaporizing liquid extinguisher, stored pressure.

Portable air-foam playpipe.



Soda-acid extinguisher, 33-gal wheeled.

ANTIFREEZE EXTINGUISHERS

For use in unheated buildings, special extinguishers are available containing antifreeze charges with freezing point below -40° F. The charge is expelled from the extinguisher by stored air pressure, or carbon dioxide released from a gas cartridge at the time of use.

The stored-pressure type unit is operated by means of a seat-type valve on the extinguisher. The gas-cartridge type extinguisher is operated by depressing the operating lever, or by inverting and bumping the extinguisher on the floor.

Extinguishers designated below as "loaded-stream" extinguishers contain a special solution of an alkali metal salt which makes them more effective than ordinary soda-acid extinguishers of equal size.

These extinguishers are suitable for fires in ordinary combustible materials, such as wood, paper, textile fibers, etc. They are not suitable for fires in oils, greases, paints, flammable liquids, etc.; for fires in live electrical equipment; or for fires in metals such as magnesium, powdered aluminum, sodium or potassium.

It is recommended that only those re-charges furnished by the manufacturer and so specified on the extinguisher nameplates be used in these extinguishers.

American LaFrance Elmira N Y

American LaFrance. Model 3H2. 2½ gal.

American LaFrance. Model PAF-2½. 2½ gal. Stored-pressure type. Stainless steel shell.

Badger Fire Extinguisher Co Chase St Methuen Mass

Badger's. 2½ gal. Drawn brass shell.

Badger's. 2½ gal. Fabricated copper shell.

Badger's Penguin. 2½ gal. Drawn brass shell. With disposable cartridge.

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind

Elkhart. Model X. 2½ gal. Drawn brass shell.

Elkhart. Model EA, 2½ gal. Stored-pressure type. Drawn brass shell.

Fire Guard Corp 1685 Shermer Rd Northbrook Ill

Fire Guard. Model W1S. 2½ gal. Stainless steel shell.

Fire Guard. Models LS-10S, PR-10S. 2½ gal. Stored-pressure type. Stainless steel shell.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Fyr-Fyter Instant. Loaded stream. Models 70-5, 70-6. 1¾ gal. Stainless steel shell.

Fyr-Fyter Instant. Loaded stream. Model 78-5-A. 2½ gal. Stainless steel shell.

Fyr-Fyter Instant. Model 78-6A. 2½ gal. Cartridge-operated. Stainless steel shell.

Fyr-Fyter. Model 94-11-A. 2½ gal. Drawn brass shell.

Fyr-Fyter. Model 78-10. 2½ gal. Stored-pressure type. Stainless steel shell.

Buffalo Better Built. Model 94-18-A. 2½ gal. Drawn brass shell.

Buffalo Better Built. Model 78-11. 2½ gal. Stored-pressure type. Stainless steel shell.

Pyrene. Model W 12-1-A. 2½ gal. Drawn brass shell.

Pyrene. Model LW12-P. 2½ gal. Stored-pressure type. Stainless steel shell.

Fyr-Fyter Co of Canada Ltd 136 Manitoba St Toronto Ont

Fyr-Fyter. Model 78-10. 2½ gal. Stored-pressure type.

Buffalo. Model 78-11. 2½ gal. Stored-pressure type.

General Air Products Corp 5345 N Kedzie Av Chicago 25 Ill

Gapco. 2½ gal.

General Fire Extinguisher Corp 8740 Washington Blvd Culver City Cal

General Quick-Aid Fire Guard. Model WC-400. 2½ gal.

General Quick-Aid Fire Guard. Model LB-500. 2½ gal. Drawn brass shell.

General Quick-Aid Fire Guard. Models IW-500b, SW-500b. 2½ gal. Stainless steel shell.

General Quick-Aid Fire Guard. Models LS-600b, WS-700b. 2½ gal. Stored-pressure type. Stainless steel shell.

General Fire Extinguisher Corp (Canada Ltd) 973 St Lawrence Blvd Windsor Ont

General Quick-Aid Fire Guard. Model WC-400. 2½ gal.

General Quick-Aid Fire Guard. Model LB-500. 2½ gal. Drawn brass shell.

General Quick-Aid Fire Guard. Models IW-500b, SW-500b. 2½ gal. Stainless steel shell.

General Quick-Aid Fire Guard. Models LS-600b, WS-700b. 2½ gal. Stored-pressure type. Stainless steel shell.

Walter Kidde & Co Inc 675 Main St Belleville N J

Kidde. Model KAM. 2½ gal.

Kidde. Model WABS-B. 2½ gal. Stored-pressure type. Drawn brass shell.

Kidde. Loaded stream. Model LPSK. 2½ gal. Stored-pressure type. Stainless steel shell.

Randolph Laboratories Inc 1450 Frontage Rd Northbrook Ill

Randolph. Model 1778S. 2½ gal. Stored-pressure type. Stainless steel shell.

Randolph. Loaded stream. Model E244S. 2½ gal. Stored-pressure type. Stainless steel shell.

Randolph. Model 1779. 2½ gal. Stainless steel shell.

Randolph. Loaded stream. Model 247S. 2½ gal. Stainless steel shell.

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich

Seco. Model 26-88A. 2½ gal. Stainless steel shell.

Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Jasper & York Sts Philadelphia 25 Pa

Stempel. Model WS-700. 2½ gal. Stored-pressure type. Stainless steel shell.

Stop-Fire Inc U S Highway No 1 New Brunswick N J

Stop-Fire. Model WC-50. 2½ gal.

Stop-Fire Redi-Jet. Models RJ-50-A, RJ-50-B. 2½ gal. Stored-pressure type.

SODA-ACID EXTINGUISHERS

Soda-acid extinguishers have an outer container holding water with a charge of sodium bicarbonate, and an inner container of acid. They are operated by inverting and allowing the acid and bicarbonate solution to mix. The formation of carbon dioxide gas creates sufficient pressure to force the contents out of the extinguisher and through the hose and nozzle.

These extinguishers are suitable for fires in ordinary combustible materials such as wood, paper, fibrous materials, etc., where a cooling and wetting agent is required. They are not recommended for fires in oils, greases, flammable liquids, etc.; for fires in electrical apparatus; or for fires in metals such as magnesium, powdered aluminum, sodium, or potassium.

Allen Mfg Co 639 S 25th Av **Bellwood Ill**
Fire-Aid. 2½ gal. Stainless steel shell.

American Fire Equipment Co 717 Boylston St **Boston 16 Mass**
Universal. 1¼, 3½ gal.

American LaFrance **Elmira N Y**
American LaFrance. Model 381. 2½ gal.
American LaFrance. Model 582. 2½ gal. Stainless steel shell.
American LaFrance. Models DU-1, DXU-1, FU-1. 33 gal. Manually operated stopple type.

Amerex Corp 76 Gold St **New York 7 N Y**
Small. 2½ gal.

Badger Fire Extinguisher Co Chase St **Methuen Mass**
Badger's Pony. 1¼ gal.
Badger's. 2½ gal. Drawn brass shell.
Badger's. 2½ gal. Fabricated copper shell.
Badger's. 2½ gal. Stainless steel shell.

Bench & Goodhue 2808 San Pablo Av **Berkeley 2 Cal**
Minuteman. 2½ gal.

Bidder Fire Prevention Div of Fire End & Cruiser Corp 656 Gerard Av **New York 51 N Y**
Chief Cruiser. 2½ gal.

Detroit Fire Extinguisher Service Co 2133 Ferry Park **Detroit Mich**
Detroit. 2½ gal.

Dyn-o-Protopulp Co 36 Chauncey Av **Toronto 18 Ont**
Paragon 88. 2½ gal.

Elkhart Brass Mfg Co 1302 W Beardsley Av **Elkhart Ind**
Elkhart. Model A. 2½ gal. Drawn brass shell.
Elkhart. Model A8. 2½ gal. Stainless steel shell.

Fire Guard Corp 1605 Shermer Rd **Northbrook Ill**
Fire Guard. Model 8A18. 2½ gal. Stainless steel shell.
Fire Guard. Model 8A2B. 2½ gal. Drawn brass shell.

Fyr-Fyter Co 221 Crane St **Dayton 1 O**
Fyr-Fyter Silver-Lite 500. Model 17-4. 2½ gal. Stainless steel shell.
Fyr-Fyter. Model 17-12. 2½ gal. Drawn brass shell.
Guardoid Fyr-Fyter. 17, 33 gal. Manually operated stopple type.
Buffalo Better Built. Model 17-5. 2½ gal. Stainless steel shell.
Buffalo Better Built. Model 17-13. 2½ gal. Drawn brass shell.
Buffalo Better Built. 17 gal. Manually operated stopple type.
Buffalo. 33 gal. Manually operated stopple type.
Pyrene. 2½ gal.
Pyrene. Model SW12. 2½ gal. Stainless steel shell.
Pyrene. Models SD2M-1, SD3M-1. 33 gal. Manually operated stopple type.

Fyr-Fyter Co of Canada Ltd 136 Manitoba St **Toronto Ont**
Fyr-Fyter. Model 17-4. 2½ gal.
Buffalo. Model 17-5. 2½ gal.

General Air Products Corp 5345 N Kedzie Av **Chicago 25 Ill**
Cogen. 2½ gal.

General Fire Extinguisher Corp 8740 Washington Blvd **Culver City Cal**
General Quick-Aid Fire Guard. Model T8-15. 2½ gal.
General Quick-Aid Fire Guard. Model S8-15b. 2½ gal. Stainless steel shell.

General Fire Extinguisher Corp (Canada Ltd) 978 St Luke Rd **Windsor Ont**
General Quick-Aid Fire Guard. Model T8-15. 2½ gal.

Walter Kidde & Co Inc 675 Main St **Belleville 9 N J**
Kidde. Model SASG. 2½ gal. Stainless steel shell.
Kidde. Model SA2B. 2½ gal. Drawn brass shell.

Walter Kidde & Co of Canada Ltd 5500 Royalmount Av **Montreal 9 P Q**
Kidde. 2½ gal.

Miller-Pocrious Mfg Co 432 N Sangamon St **Chicago Ill**
Standard. 2½ gal.
Standard. 2½ gal. Stainless steel shell.
Standard. 2½ gal. Drawn brass shell.

National Foam System Inc **West Chester Pa**
Paragon 88. 2½ gal.

Pacific Fire Extinguisher Co 142 Ninth St **San Francisco 3 Cal**
Pacific. 2½ gal.

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway **Toronto Ont**
Pyrene. 2½ gal.
Pyrene. 33 gal. Loose or manually operated stopple type.

Randolph Laboratories Inc 1450 Frontage Rd **Northbrook Ill**
Randolph. 2½ gal.
Randolph. 2½ gal. Stainless steel shell.

Safety Fire Extinguisher Co 393 Seventh Av **New York N Y**
Safety. Ajax. 2½ gal.

Safety First Products Corp 173 Saw Mill River Rd **Elmsford N Y**
Safety First. 2½ gal.

Schwartz Bros Inc 827 Arch St **Philadelphia 7 Pa**
SOS Defender. 2½ gal.

Sears Roebuck & Co 925 S Homan Av **Chicago Ill**
Allstate. 2½ gal.

Seco Mfg Inc 4461 W Jefferson Av **Detroit 9 Mich**
Seco. Models 17-6 (copper shell), 17-8 (stainless steel shell) 2½ gal.
Seco. Model 20-S8A. 2½ gal. Stainless steel shell.

M L Snyder & Son Ltd Pine St **Woodbridge Ont**
Arrow. Model T8-15. 2½ gal.

Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Son Jasper & York Sts **Philadelphia Pa**
Kontrol. 2½ gal.
Stempel. Model 17. 2½ gal.

Stop-Fire Inc U S Highway No 1 **New Brunswick N J**
Stop-Fire. Model 8A-50. 2½ gal.

Wirt & Knox Mfg Co Sedgley Av **Philadelphia Pa**
Wirtz. 2½ gal.

CARBON DIOXIDE EXTINGUISHERS

Portable carbon dioxide extinguishers consist of a storage cylinder constructed according to ICC specifications for pressure vessels containing carbon dioxide, a hand-operated valve, and a discharge horn connected to the valve by flexible hose or a short piece of metal tubing. Fifty-pound and larger units are mounted on wheels.

These extinguishers are discharged by operating the valve using a handwheel, squeeze grip, or trigger.

Carbon dioxide extinguishers are used chiefly for fires involving electrical equipment, and open tanks of flammable liquids. They need not be protected against freezing. The gas is non-corrosive and leaves no residue. Because carbon dioxide extinguishers have no wetting action and produce no permanent blanketing effect, they are not considered suitable for fires in

ordinary combustible material. Their use must necessarily be confined to moderately small fires because successful operation requires close approach to the fire.

These extinguishers are not suitable for fires in metals such as magnesium, powdered aluminum, sodium, potassium, or finely divided iron or steel turnings.

For protection of tanks inside buildings, except small tanks, portable extinguishers alone should not be relied upon because smoke and heat may hinder close approach.

Ace Chemical Co 221 N First St Brighton Mich

Ace. Models ACC-5 (5 lb), AC-10 (10 lb), AC-15 (15 lb), AC-20 (20 lb).

W D Allen Mfg Co 630 S 25th Av Bellwood Ill

Allenco. Models 7400-2½ (2½ lb), 7400-5 (5 lb), 7400-10 (10 lb), 7400-15 (15 lb).

Allenco. Models 5S (5 lb), 10S (10 lb), 15S (15 lb), 20S (20 lb).

American LaFrance Elmira N Y

American LaFrance. Models 2½ (2½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb).

Alflite-Speedex. Models 2½ (2½ lb), 3½ (3½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb).

American LaFrance. Series 4. Wheeled extinguishers. Models 50-S (50 lb), 75-S (75 lb), 100-S (100 lb).

Ansul Chemical Co Fire Equipment Div Marinette Wis

Ansul. Models CD-2½ (2½ lb), CD-5 (5 lb), CD-10 (10 lb), CD-15 (15 lb), CD-20 (20 lb).

Ansul Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor) 747 Vaughan Rd Toronto 10 Ont

Ansul. Models CD-2½ (2½ lb), CD-5 (5 lb), CD-10 (10 lb), CD-15 (15 lb), CD-20 (20 lb).

Badger Fire Extinguisher Co Chase St Methuen Mass

Badger's Northwind. Models BN-2 (2 lb), BN-2½ (2½ lb), BN-4 (4 lb), BN-5 (5 lb), BN-10 (10 lb), BN-15 (15 lb), BN-20 (20 lb).

Cardox Div Chemetron Corp 840 N Michigan Av Chicago Ill

Models C 5 (5 lb), C 10 (10 lb), C 12 (12 lb), C 15 (15 lb), C 20 (20 lb).

Cardox Transitank Fire Extinguishing Unit. ½ ton.

C-O-Two Fire Equipment of Canada Ltd 91 E Don Roadway Toronto Ont

Squeez-Grip. Models PSA-2½ (2½ lb), PSA-5 (5 lb), PSH-10 (10 lb), PSH-15 (15 lb), PSH-20 (20 lb).

C-O-Two Wheeled extinguishers. Models WB50 (50 lb), WB75 (75 lb), WB100 (100 lb, handwheel-operated seat-type), WVF100 (100 lb, lever-operated seat-type).

C-O-Two Hose-reel and Hose-rack Fixed-cylinder System. One or more 50- or 75-lb cylinders permanently located, and not more than 100 ft of ½-in. hose and pipe. Fire rating same as equivalent extinguisher not to exceed rating of 100 lb extinguisher.

C-O-Two Systems Div Fyr-Fyter Co U S Highway No 1 Newark 1 N J

C-O-Two Hose-reel and Hose-rack Fixed-cylinder System. One or more 50- or 75-lb cylinders permanently located, and not more than 100 ft of ½-in. hose and pipe. Fire rating same as equivalent extinguisher, not to exceed rating of 100-lb extinguisher.

Croker Fire Prevention Div of Fire End & Croker Corp 656 Gerard Av New York 51 N Y

Croker. Models 2½ (2½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb).

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind

Elkhart. Models CDS-2½ (2½ lb), CDS-5 (5 lb), CD-10 (10 lb), CD-15 (15 lb), CD-20 (20 lb).

Elkhart Wheeled Extinguisher. Model 50 CD (50 lb). Wheel seat-type valve.

Fire Guard Corp 1685 Shermer Rd Northbrook Ill

Fire Guard. Models FF2½ (2½ lb), FF5 (5 lb), FF10 (10 lb), FF15 (15 lb), FF20 (20 lb).

Fire Guard Wheeled Extinguishers. Models FF50 (50 lb), FF75 (75 lb), FF100 (100 lb). Wheel seat-type valve.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Fyr-Fyter. Models 33-1B (2½ lb), 33-1B (5 lb), 34-1A (10 lb), 34-1B (10 lb), 35-1A (15 lb), 35-1B (15 lb), 36-1A (20 lb), 36-1B (20 lb).

Fyr-Fyter. Models 38-1 (50 lb), 39-1 (75 lb, handwheel-operated seat type), 40-1 (100 lb, lever-operated seat type).

Buffalo Better Built. Models 32-2 (2½ lb), 32-2B (2½ lb), 33-2 (5 lb), 33-2B (5 lb), 34-2A (10 lb), 34-2B (10 lb), 35-2A (15 lb), 35-2B (15 lb), 36-2A (20 lb), 36-2B (20 lb).

Buffalo Better Built. Models 38-2 (50 lb), 39-2 (75 lb), handwheel-operated seat type), 40-2 (100 lb, lever-operated seat type).

C-O-Two. Types PSA-2½ (2½ lb), PSA-5 (5 lb), PSH-10 (10 lb), PSH-15-1 (15 lb), PSH-20-1 (20 lb).

C-O-Two Wheeled Extinguishers. Models WB50 (50 lb), WVF50 (50 lb), WB75 (75 lb), WVF75 (75 lb), WB100 (100 lb), WVF100 (100 lb).

C-O-Two Hose-reel and Hose-rack Fixed-cylinder System. One or more 50- or 75-lb cylinders permanently located, and not more than 100 ft of ½-in. hose and pipe. Fire rating same as equivalent extinguisher not to exceed rating of 100-lb extinguisher.

Pyrene. Types VAV2½ (2½ lb), VAV5 (5 lb), VAV10 (10 lb), VAVH15 (15 lb), VAVH20 (20 lb).

Fyr-Fyter Co of Canada Ltd 136 Manitoba St Toronto Ont

Fyr-Fyter. Models 32-1 (2½ lb), 33-1 (5 lb), 34-1 (10 lb), 35-1 (15 lb), 36-1 (20 lb).

Buffalo. Models 32-2 (2½ lb), 33-2 (5 lb), 34-2 (10 lb), 35-2 (15 lb), 36-2 (20 lb).

General Air Products Corp 5345 N Kedzie Av Chicago 25 Ill

Gapco. Models SR-2½ (2½ lb), SRQ-5 (5 lb), SRH-10 (10 lb), SRH-15 (15 lb), SRH-20 (20 lb)

General Fire Extinguisher Corp 8740 Washington Blvd Culver City Cal

General Quick Aid Fire Guard. Models 2½R (2½ lb), 5R (5 lb), 10R (10 lb), 15R (15 lb), 20R (20 lb).

General Quick Aid Fire Guard Wheeled Extinguisher. Models 50A (50 lb), 75A (75 lb), 100A (100 lb). Wheel seat-type valve.

General Fire Extinguisher Corp (Canada Ltd) 978 St Luke Rd Windsor Ont

General Quick Aid Fire Guard. Models 2½R (2½ lb), 5R (5 lb), 10R (10 lb), 15R (15 lb), 20R (20 lb).

Walter Kidde & Co Inc 675 Main St Belleville N J

Kidde. Models 2½F-1 (2½ lb), 5F-1 (5 lb), 10F-1 (10 lb), 15F-1 (15 lb), 20F-1 (20 lb).

Kidde. Models 2½T-2 (2½ lb), 5T-2 (5 lb), 10T-2 (10 lb), 15T-2 (15 lb), 20T-2 (20 lb). Trigger operated.

Kidde Wheeled Extinguishers. Models 50-1 (50 lb), 75-1 (75 lb), 100-1 (100 lb). Seat-type valve.

Kidde Hose-reel Fixed-cylinder System. Two or more 50- or 75-lb cylinders permanently located, and not more than 100 ft of ½-in. hose and pipe. Fire rating same as 100-lb extinguisher.

Walter Kidde & Co of Canada Ltd 5500 Royalmount Av Montreal 9 P Q

Kidde. Models 2½T-1 (2½ lb), 5T-1 (5 lb), 10T-1 (10 lb), 15T-1 (15 lb), 20T-1 (20 lb). Trigger operated.

...le Wheeled Extinguishers. Models 50 (50 lb), 75 (75 lb), ...00 lb). Wheel mst-type valve.

...-Pacific Mfg Co 452 N Sangamon St Chicago Ill
...ne-Pacific. Models MP-5 (5 lb), MP-10 (10 lb), MP-15 ...).

...e Pit Products Inc 43 Pearl St Buffalo 2 N Y
...ne-Pak. Models T-30 (2½ lb), T-50 (5 lb), T-100 (10 lb), ...(15 lb).

...ph Laboratories Inc 8 E Kinzie St Chicago 11 Ill
...ralph. Models C-4 (4 lb), C-5 (5 lb), C-10 (10 lb), CG-15 ...).
...ralph. Models E-2 (2 lb), E-6 (6 lb), E-12 (12 lb), E-18 ...).
...ralph. Models R-10 (10 lb), R-15 (15 lb), R-25 (25 lb).
...ralph Wheeled Extinguisher. Model R-50 (50 lb).

...y Fire Extinguisher Co 293 Seventh Av New York 1 N Y
...ney. Models CDO-5 (5 lb), CDO-15 (15 lb).
...ney. Models DO-2½ (2½ lb), DO-5 (5 lb), DO-10 (10 lb), ...5 (15 lb).

...ers Bros Inc 827 Arch St Philadelphia 7 Pa
...ne Defender. Models C-2½ (2½ lb), C-5 (5 lb), C-10 (10 lb), ...5 lb), C-20 (20 lb).
...ne Defender. Models R-2½ (2½ lb), R-5 (5 lb), R-10 (10 lb), ...15 lb), R-30 (30 lb).

...e Bostwick & Co 925 S Homan Av Chicago Ill
...Matic. Models 6500 (2½ lb), 6501 (5 lb), 6481 (10 lb), ...(15 lb).

...e Manufacturing Inc 4461 W Jefferson Detroit 9 Mich
...ion. Models 2½ (2½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), ...0 lb).

...ard Fire Extinguisher Mfg Co Div of M L Snyder & Son
...ayer & York Sts Philadelphia Pa
...ard. Models C-5 (5 lb), R-10 (10 lb), R-15 (15 lb).
...ard Wheeled Extinguisher. Model R-50 (50 lb).
...ard. Models 402 (2½ lb), 405 (5 lb), 410 (10 lb), 415 ...lb), 420 (20 lb).

...e-Fire Inc U S Highway No 1 New Brunswick N J
...ne-Fire Redi-Freeze. Models CD-2½ (2½ lb), CD-5 (5 lb), ...10 lb), CD-15 (15 lb), CD-20 (20 lb).

...ker & Trouth Co 1547-57 University Av St Paul 4 Minn
...W A 7. 2½ 5, 10, 15 lb.

...Y-CHEMICAL EXTINGUISHERS, Regular Type

Regular-type dry-chemical extinguishers are intended ...marily for flammable-liquid and electrical fires. ...ey are also effective on surface-type textile fires. ...e extinguishing agent is a dry, sodium-bicarbonate-...e chemical powder treated to provide maximum ...ectiveness.

An extinguisher consists of a container holding the ...y chemical, which is either under constant pressure ...is pressurized at time of operation. Dry air, nitrogen, ...r a carbon dioxide cartridge is used for pressure. ...hen the extinguisher is pressurized, a valve controls ...he discharge which is in the form of a dense cloud.

The extinguishers are not subject to freezing and the ...hemical is treated to minimize caking from moisture.

Approval covers the extinguisher and the specified brand of dry chemical as a combination. No other material should be used.

Ace Chemical Co 221 N First St Brighton Mich
Ace. Model E-229 (2½ lb).

Allan-Jervis Marine Box 86 325 Duffy Av Hicksville N Y
Model 2½ (2½ lb).

American LaFrance Elmira N Y
The following are approved for use with American LaFrance "B" dry chemical:
American LaFrance. Models PDC-2½ (2½ lb), PDC-5 (5 lb 8 oz), PDC-10 (10 lb 14 oz), PDC-20 (20 lb), PDC-30 (30 lb), Stored-pressure type.
American LaFrance. Models 5DCL (5 lb 8 oz), 10DCL (10 lb 14 oz), 20DCL (20 lb).
American LaFrance Wheeled Extinguishers. Models 150 (150 lb), 350A (350 lb).

Ansul Chemical Co Fire Equipment Div Marinette Wis
The following are approved for use with Ansul Plus-50-B dry chemical:
Ansul. Models 5 (5 lb), 10-C (10 lb), 20-D (20 lb), 30-D (30 lb).
Ansul. Models LR-5 (5 lb), LR-10-C (10 lb), LR-20-D (20 lb), LR-30-D (30 lb). Long-range nozzle.
Ansul. Models SP-10 (10 lb), SP-20 (20 lb), SP-30 (30 lb). Stored-pressure type.
Ansul Wheeled Extinguishers. Models 150-B (150 lb), 350-B (350 lb), HF-350-B (350 lb).

Ansul Chemical Co (satr) Levitt-Safety Ltd (Canadian distributor) 747 Vaughan Rd Toronto 10 Ont
The following are approved for use with Ansul Plus-50-B dry chemical:
Ansul. Models 5 (5 lb), 10-C (10 lb), 20-D (20 lb), 30-D (30 lb).
Ansul. Models LR-20-D (20 lb), LR-30-D (30 lb). Long-range nozzle.
Ansul. Models SP-10 (10 lb), SP-20 (20 lb), SP-30 (30 lb). Stored-pressure type.
Ansul Wheeled extinguishers. Models 150-B (150 lb), 350-B (350 lb), HF-350-B (350 lb).

Badger Fire Extinguisher Co Methuen Mass
Badger. Model DJ-2½ (2½ lb). Stored-pressure type.

Casco Products Corp 512 Hancock Av Bridgeport 2 Conn
Models 2½ (2½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb), 25 (25 lb), 30 (30 lb).

C-O-Two Fire Equipment of Canada Ltd 91 E Don Roadway Toronto Ont
The following are approved for use with C-O-Two dry chemical:
C-O-Two. Types PDC-4 (4 lb), PDC-20 (20 lb), PDC-30 (30 lb).
C-O-Two Wheeled Extinguisher. Type WDC-150 (150 lb).

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind
Models 5DCL (5 lb 8 oz), 10DCL (10 lb 14 oz), 20DCL (20 lb).

Fire Control Products Inc 1925 W Blanke St Linden N J
Models 2½ (2½ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb), 25 (25 lb), 30 (30 lb).

Fire Guard Corp 1685 Shermer Rd Northbrook Ill
Fire Guard. Models D-4, DC-4S, DC-4HS and D-4H (4 lb), D-10 and D-10A (10 lb).
Fire Guard Wheeled Extinguisher. Model D-150 (150 lb).
Fire Guard. Model SPS-2½ (2½ lb). Stored-pressure type.

Fyr-Fyter Co 221 Crane St Dayton 1 O
The following are approved for use with Fyr-Fyter dry chemical:
Fyr-Fyter. Models 23-3 (2½ lb), 29-1 and 29-5 (5 lb), 26-5 (10 lb), 27-5 (20 lb), 28-5 (30 lb). Stored-pressure type.
Fyr-Fyter. Models 26-1 (10 lb), 27-1 (20 lb), 28-1 (30 lb).
Fyr-Fyter Wheeled Extinguishers. Models 90-1 (75 lb), 91-1 (150 lb).

The following are approved for use with Buffalo dry chemical:
Buffalo Better Built. Models 26-2 (10 lb), 27-2 (20 lb), 28-2 (30 lb).
Buffalo Better Built. Models 23-4 (2½ lb), 29-2 and 29-6 (5 lb), 26-6 (10 lb), 27-6 (20 lb), 28-6 (30 lb). Stored-pressure type.
Buffalo Better Built Wheeled Extinguishers. Models 90-2 (75 lb), 91-2 (150 lb).

The following are approved for use with C-O-Two dry chemical:
C-O-Two. Types PDC-2½P (2½ lb), PDC-5P, PDC-5PB, PDC-5PF, and PDC-5P8S (5 lb), PDC-10P8S and PDC-10P (10 lb), PDC-20P and PDC-20P8S (20 lb), PDC-30P and PDC-30P8S (30 lb). Stored-pressure type.
C-O-Two. Types PDC-4 and PDC-4S (4 lb), PDC-20 (20 lb), PDC-30 (30 lb).
C-O-Two. Types PDC-20S8 (20 lb), PDC-30S8 (30 lb). Long-range nozzle.
C-O-Two Wheeled Extinguishers. Types WDC-75A (75 lb), WDC-150A (150 lb).

Fyr-Fyter Co of Canada Ltd 136 Manitoba St Toronto Ont
Fyr-Fyter. Models 26-1 (10 lb), 27-1 (20 lb), 28-1 (30 lb).
Buffalo. Models 26-2 (10 lb), 27-2 (20 lb), 28-2 (30 lb).
Fyr-Fyter. Models 23-3 (2½ lb), 29-1 (5 lb), 26-5 (10 lb), 27-5 (20 lb), 28-5 (30 lb). Stored-pressure type.
Buffalo. Models 23-4 (2½ lb), 29-2 (5 lb), 26-6 (10 lb), 27-6 (20 lb), 28-6 (30 lb). Stored-pressure type.

General Fire Extinguisher Corp 8740 Washington Blvd Culver City Cal
The following are approved for use with Quick-Aid dry chemical:
General Quick-Aid Fire Guard. Models DC-4, DC-4S, DC-4HS, and DC-4H (4 lb), DC-10A (10 lb).
General Quick-Aid Fire Guard. Models CP-5 (5 lb), CP-10 (10 lb), CP-20 (20 lb). Stored-pressure type.
General Quick-Aid Fire Guard Wheeled Extinguisher. Model WDC-150 (150 lb).
General Quick-Aid Fire Guard. Model CP8-2½ (2½ lb). Stored-pressure type.

General Fire Extinguisher Corp (Canada Ltd) 975 St Luke Rd Windsor Ont
The following are approved for use with Quick-Aid dry chemical:
General Quick-Aid Fire Guard. Models DC-4, DC-4S, DC-4HS, DC-4H (4 lb), DC-10 (10 lb).

"L P" Harness Co Inc 2627 S Seventh Av Birmingham 5 Ala
Vulcan. Models 1½ (1½ lb), 2¾ (2¾ lb). Stored-pressure type.

International Chemical Extinguisher Co Dayton Tenn
Keefe. Model 7. 6½ lb. Approved for use with Keefe dry chemical.

International Harvester Corp 180 N Mich Av Chicago Ill
IH. Model 926656-R-91 (10 lb).
Models 244-121-R91 (2½ lb), 244-044-R91 (5 lb). Stored-pressure type.

Walter Kidde & Co Inc 675 Main St Belleville N J
The following are approved for use with Kidde dry chemical:
Kidde. Models 2½DCP-1 (2½ lb), 5DCP-2 (5 lb), 10DCP-1 (10 lb), 20DCP (20 lb), 30 DCP (30 lb). Stored-pressure type.
Kidde Wheeled Extinguisher. Model 200 DCP (200 lb).

Walter Kidde & Co of Canada Ltd 5500 Royalmount Ave Montreal 9 P Q
The following are approved for use with Kidde dry chemical:
Kidde. Models 5P (5 lb), 10P (10 lb). Stored-pressure type.
Kidde. Models 20 (20 lb), 30 (30 lb).

Loeder Safety Products 512 Hancock Av Bridgeport 2 Conn
Models 2¾ (2¾ lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb), 25 (25 lb), 30 (30 lb).

McGinnis Marine Service 1435 E Northlake Seattle 2 Wash
Marine. Model CG-2½. 2½ lb.

Moor-Fite Inc 1153 S Eastern Av Los Angeles 22 Cal
Model 2¾ (2¾ lb).

Perfection Products 512 Hancock Av Bridgeport 2 Conn
Models 2¾ (2¾ lb), 5 (5 lb).

Power-Pak Products Inc 43 Pearl St Buffalo 2 N Y
Power-Pak. Model CM-2.5. 2½ lb.

Randolph Laboratories Inc 1450 Frontage Rd Northbrook Ill
Randolph. Model No. 1767. 15 lb. Approved for use with Randolph dry chemical.

Safety First Products Corp 175 Saw Mill River Rd Elmsford N Y
The following are approved for use with Safety First dry chemical:
Safety First. Models Safe-T-Meter 10 (10 lb), 15 (15 lb), 20 (20 lb), 25 (25 lb). Stored-pressure type.
Safety First. Models 7½ (7½ lb), 10 (10 lb), 20 (20 lb), 25 (25 lb), 30 (30 lb).
Safety First Safe-T-Meter Wheeled Extinguisher. Model (150 lb). Stored-pressure type.

Schwartz Brothers Inc 827 Arch St Philadelphia 7 Pa
SOS Defender. Models 1½ (1½ lb), 2½ (2½ lb), 2¾ (2¾ lb), 4 (4 lb), 5 (5 lb), 10 (10 lb), 15 (15 lb), 20 (20 lb), 25 (25 lb), 30 (30 lb). Stored-pressure type.

Sears Roebuck & Co Chicago Ill
Models 2¾ (2¾ lb), 5 (5 lb).

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich
Seco. Model P-2½. (2½ lb).
Seco. Models C-4 (4 lb), CP-5 (5 lb), C-10A (10 lb) cartridge operated, CP-10 (10 lb) stored pressure, CP-20 (20 lb), CP-30 (30 lb).

Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Co Jasper & York Sts Philadelphia 25 Pa
Stempel. Models 304 (4 lb), 310 (10 lb).
Stempel. Model 503 (2¾ lb).
Stempel. Models 502 (1½ lb), 504 (4 lb), 505 (5 lb), 510 (10 lb), 520 (20 lb), 530 (30 lb). Stored-pressure type.
Stempel. Model 602 (2½ lb).

Stop-Fire Inc U S Highway No 1 New Brunswick N J
Stop-Fire. Models DC-1½C (1½ lb), DC-3C (3 lb), DC-2½C (2½ lb), DC-3C (3 lb), DC-4C (4 lb), DC-5C (5 lb), DC-10C (10 lb), DC-15C (15 lb), DC-20C (20 lb), DC-25C (25 lb), DC-30C (30 lb). Stored-pressure type.

Yankee Metal Products Corp Norwalk Conn
Yankee. Model M600A. 2½ lb.

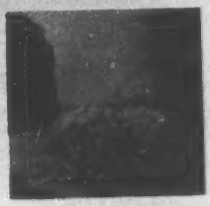
DRY-CHEMICAL EXTINGUISHERS, General-purpose Type

General-purpose dry-chemical extinguishers have a special dry chemical which makes them suitable for fires in ordinary combustibles as well as in flammable

Soda-acid extinguisher used on motor.

Foam extinguisher used on open tank.

Double-powder foam generator.



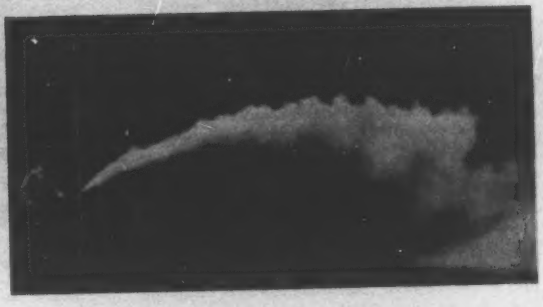
Foam produced by a 2½-gal extinguisher

Antifreeze extinguisher tested in cold cabinet.

Pump tank refilled while in use.

Hydrostatic test pump.

Soda-acid stream used on burning trash.



Dry chemical blankets large area.

liquids and electrical equipment. Appearance, method of operation and low-temperature suitability are essentially the same as for the sodium-bicarbonate-base type.

Considering effectiveness on fires in ordinary combustibles only, the general-purpose dry-chemical extinguishers compare with approved water types as follows:

General-purpose Dry Chemical	*Water Type*
10 lb capacity	One 2½ gal extinguisher
20 lb capacity	One to two 2½ gal extinguishers used consecutively
30 lb capacity	Two 2½ gal extinguishers used consecutively

The general-purpose dry chemical becomes sticky when heated and clings to hot surfaces after they cool. Consequently, it usually cannot be brushed or blown from the equipment as sodium-bicarbonate-base chemical often can. For this reason it is not recommended for areas such as textile card rooms or other locations where many fine machine parts may require individual cleaning after a fire.

Approval covers the extinguisher and the specified brand of dry chemical as a combination. No other material should be used.

Care should be taken not to mix the special chemical with other dry powder or use it in extinguishers which have contained other powder.

American LaFrance Elmira N Y
The following are approved for use with American LaFrance All-Use dry chemical:
American LaFrance Models P-10 (10 lb), P-20 (20 lb). Stored-pressure type.

Fyr-Fyter Co 221 Crane St Dayton 1 O
The following are approved for use with Fyr-Fyter All-Purpose dry chemical:
Fyr-Fyter Models 52-1 (20 lb), 53-1 (30 lb).
C-O-Two Types ABC-20P (20 lb), ABC-30P (30 lb).
Buffalo Models 52-2 (20 lb), 53-2 (30 lb).

Walter Kidde & Co Inc 675 Main St Belleville N J
The following are approved for use with Kidde Tri-Class-ABC dry chemical.
Models 10 ABC (10 lb), 20 ABC (20 lb).

FOAM EXTINGUISHERS

Fire-extinguishing foam is produced in two ways: (1) by the mixture of chemical solutions, known as *chemical foam*, and (2) by aspirating air into a mixture of foam liquid and water, known as *air foam*.

Portable foam extinguishers are suitable primarily for use on fires in flammable liquids, the types of which depend upon the type of foam produced as outlined under the following sub-headings. Foam extinguishers are not advised for use on fires in ordinary combustibles or live electrical equipment. They are also unsuited for fires in metals such as magnesium, powdered aluminum, sodium, potassium, or for finely divided iron or turnings (steel wool).

CHEMICAL-FOAM EXTINGUISHERS

These extinguishers are constructed with two tainers to hold the A and B solutions of a foam ch When the extinguisher is inverted the chemicals mi produce foam which is discharged by the pressu carbon dioxide gas formed by the chemical reaction

These portable chemical foam extinguishers are able only for use on fires in ordinary hydrocar flammable liquids such as oil, gasoline, benzol, Special types of chemical foam equipment are avail for fires in alcohols, ethers, esters, ketones, etc. listings under Chemical Foam Generators) and for in hot oils and asphalts heated above 250°F. (see spe listings of chemical foam under Foam Extinguis Systems).

Each foam extinguisher and its charge is approve a unit and therefore the brand and manufacturer of extinguisher should be specified in purchasing cha Directions with the charge should be followed caref

For tanks *inside* buildings, because of the hindra to approach caused by smoke and heat, portable tinguishers alone should not be relied upon except small tanks.

American Fire Equipment Co 717 Boylston St Boston 16 Ma
Universal. 2½ gal.

American LaFrance Elmira N Y
American LaFrance. Model 3F1. 2½ gal.
American LaFrance. Models 5F2, 5F4. 2½ gal. Stainless shell.
Firefoam. Models FF, DF, DXF. 35 gal.
Challenger. Models FMC, DMC, DXMC. 30 gal.

Arcall Corp 76 Gold St New York 7 N Y
Arcall. 2½ gal.

Badger Fire Extinguisher Co Chase St Methuen Mass
Badger's Pony Foam. 1¼ gal.
Badger's. 2½ gal. Drawn brass shell.
Badger's. 2½ gal. Fabricated copper shell.
Badger's. 2½ gal. Stainless steel shell.

Church & Goodhue 2806 San Pablo Av Berkeley 2 Cal
Minuteman. 2½ gal.

Croker Fire Prevention Div of Fire End & Croker Corp 695 Ge ard Av New York 51 N Y
Chief Croker. 2½ gal.

Detroit Fire Extinguisher Service Co 2133 Ferry Park Det Mich
Detroit. 2½ gal.

Doyle-Protequip Co 36 Chauncey Av Toronto 18 Ont
National. 2½ gal.
National 88. 2½ gal.

Elkhart Brass Mfg Co 1302 W Beardsley Av Elkhart Ind
Elkhart. Model B. 2½ gal. Drawn brass shell.
Elkhart. Model B8. 2½ gal. Stainless steel shell.

Guard Corp 1665 Shermer Rd Northbrook Ill
Guard. Model F1S. 2½ gal. Stainless steel shell.
Guard. Models F2B, SA2B. 2½ gal.

Fyter Co 221 Canal St Dayton 1 O
-Fyter-Silver-Lite 500. Model 18-4. 2½ gal. Stainless shell.
-Fyter. Model 18-24. 2½ gal. Drawn brass shell.
Fyter. Model 18-5. 2½ gal. Stainless steel shell.
Better Built. Model 18-5. 2½ gal. Stainless steel shell.
Better Built. Model 18-25. 2½ gal. Drawn brass shell.
Better Built. 20 gal.
38 gal.
2½ gal.
Model PW12. 2½ gal. Stainless steel shell.
Models PD2PN-1, PD3PN-1, PD4PN-1. 38 gal.
Model PB-12. 2½ gal. Drawn brass shell.

Fyter of Canada Ltd 136 Manitoba St Toronto Ont
-Fyter. Model 18-4, 2½ gal.
Model 18-5. 2½ gal.

Gas Air Products Corp 5345 N Kedzie Av Chicago 25 Ill
Foyer. 2½ gal.

General Fire Extinguisher Corp 8740 Washington Blvd Culver City Cal
General Quick-Aid Fire Guard. Model TF-4. 2½ gal.
General Quick-Aid. Model F-840. 38 gal.
General Quick-Aid Fire Guard. Model SF-4b. 2½ gal. Stainless steel shell.

General Fire Extinguisher Corp (Canada Ltd) 978 St Luke Rd Windsor Ont
General Quick-Aid Fire Guard. Model TF-4. 2½ gal.
General Quick-Aid Fire Guard. Model SF-4b. 2½ gal. Stainless steel shell.
General Quick-Aid. Model F-840. 38 gal.

Walter Kidde & Co Inc 675 Main St Belleville 9 N J
Kidde. Model F8G. 2½ gal. Stainless steel shell.
Kidde. Model FD8. 2½ gal. Drawn brass shell.
Kidde. 38 gal.

Walter Kidde & Co of Canada Ltd 5500 Royalmount Av Montreal 9 P Q
Kidde. 2½ gal.

Miller-Peerless Mfg Co 452 N Sangamon St Chicago Ill
Miller-Peerless. 2½ gal. Stainless steel shell.
Miller-Peerless. 2½ gal. Drawn brass shell.
Miller-Peerless. 38 gal.

National Foam System Inc West Chester Pa
National. 2½ gal.
National 88. 2½ gal.

Pacific Fire Extinguisher Co 142 Ninth St San Francisco 3 Cal
Pacific. 2½ gal.

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto Ont
Pyrene. 2½ gal, 38 gal.
Pyrene. Model PW-12. 2½ gal. Stainless steel.

Randolph Laboratories Inc 1450 Frontage Rd Northbrook Ill
Randolph. 2½ gal.
Randolph. 2½ gal. Stainless steel shell.

Safety Fire Extinguisher Co 293 Seventh Av New York 1 N Y
Safeum. 2½ gal.
Safety. 2½ gal.

Schwartz Bros Inc 827 Arch St Philadelphia 7 Pa
808 Defender. 2½ gal.

Sears Roebuck & Co 925 S Homan Av Chicago Ill
Allstate. 2½ gal.

Seco Mfg Inc 4461 W Jefferson Av Detroit 9 Mich
Seco. Models 18-6 (copper shell), 18-5 (stainless steel shell). 2½ gal.
Seco. Model 24-SSA. 2½ gal. Stainless steel shell.

M L Snyder & Son Ltd Pine St Woodbridge Ont
Aristocrat. Model TF-4. 2½ gal.

Stempel Fire Extinguisher Mfg Co Div of M L Snyder & Son Jasper & York Sts Philadelphia Pa
Kontrol. 2½ gal.
Stempel. Model 12. 2½ gal. Stainless steel shell.

Stop-Fire Inc U S Highway No 1 New Brunswick N J
Stop-Fire. 2½ gal.

CHEMICAL-FOAM GENERATORS

For use where large and continuous quantities of foam are desirable. See general introductory note under "Foam Extinguishers."

Chemical-foam generators may be either single or double powder type. Foam powder is placed in the storage hopper or hoppers, and is drawn into the stream of water passing through the generator. With a single powder generator, foam is discharged from the generator outlet. With the double powder generator, the A and B parts of the foam charge are dissolved in separate water lines, and foam is not produced until the solutions come together where the lines are siamesed.

The single powder generator is generally used for flammable liquid storage tanks up to 60 ft. diameter, providing the distance between the foam generator and the storage tank does not exceed 600 ft. The double powder generator is used if the tank diameter exceeds 60 ft. or the distance between the generator and the tank is greater than 600 ft.

Contracts for permanently piped systems should be let subject to Factory Mutual acceptance, obtained by the manufacturer prior to installation. Drawings showing the installation details and a complete description of the hazard should be submitted to the Factory Mutual Engineering Division for review.

American LaFrance Elmira N Y

Foamite Generators. Single powder. Models 15D, 21D, 25D. For use with Foamite powder on oil or gasoline fires and with Alco-foam powder on fires in alcohols, ethers, esters, and ketones. Approved for portable service with proper size hose and nozzle, and for piped systems with Foamite Type 6-JG foam chamber.

	Inlet pressure, psi	*Water draft, gpm*	*Foam produced, gpm*			
			6-JG Chamber		*Portable hose stream*	
			Foamite	*Alcofoam*	*Foamite*	*Alcofoam*
Model 15D	50	75	690	690	690	690
	75	90	900	900	900	900
	100	105	1200	1150	1050	980
	125	116	1300	1350	1150	1080
Model 21D	50	105	1300	1300	1080	980
	75	132	1400	1350	1200	1100
	100	150	1600	1450	1300	1200
	125	171	1650	1700	1450	1450
Model 25D	50	155	1550	1600	1600	1380
	75	189	1950	1750	1650	1600
	100	210	2050	1900	2050	1900
	125	233	2250	2100	2200	2100

Doyle-Protequip Co 36 Chauncey Av Toronto 18 Ont
See listing of National Foam System, Inc.

National Foam System Inc West Chester Pa

National-Fomon Generators. Types D-18, D-36, D-75. For use with National-Fomon A and B chemicals for portable service with deluge sets types 18, 36, and 75 respectively, and for piped systems with types L or C foam chambers.

National-Fomon Generators. Types S-6, S-9, S-21, S-33. For use with National-Fomon 2-in-1 chemical on oil or gasoline fires and with "National 99" chemical on fires in liquids similar to alcohol. For portable service with proper size hose and nozzle, and for piped systems with types L or C foam chambers.

	Inlet pressure, psi	Water draft, gpm	Foam produced, gpm National 2 in 1 powder	Foam produced, gpm National A & B powder	Foam produced, gpm National 99 powder
Model S-6	50	16	200		130
	100	23	350		225
Model S-9	50	24	300		200
	100	33	650		425
Model S-21	50	60	800		520
	100	85	1250		800
Model S-33	50	95	1250		780
	100	125	2200		1450
Model D-18	50	70		950	
	100	95		1300	
Model D-36	50	150		2500	
	100	200		3200	
Model D-75	50	255		2950	
	100	290		4230	

CHEMICAL-FOAM POWDER, for Alcohols, Ethers, Esters

The foam chemicals listed below are approved for use in producing foam for fires in alcohols, ethers, and esters, as well as oil and gasoline. Before installing permanently piped systems, drawings showing the installation details and a complete description of the hazard should be submitted to the Factory Mutual Engineering Division for review.

American LaFrance Elmira N Y

Alcofoam Powder. For use with approved Foamite single-powder foam generators.

Doyle-Protequip Co 36 Chauncey Av Toronto 18 Ont

National 99 Foam Chemical. For use with approved National single-powder foam generators.

National Foam System Inc West Chester Pa

National 99 Foam Chemical. For use with approved National single-powder foam generators.

AIR-FOAM EQUIPMENT

These playpipes are designed to aspirate air into a mixture of foam liquid and water, and produce foam. They may be attached to 1½-in. or 2½-in. woven-jacketed rubber-lined hose. Do not use linen hose since lint may clog screens. The proper amount of foam liquid may be introduced at the playpipe by using a pick-up tube, or at a remote point by using a proportioner in the water supply line.

The playpipes listed here are suitable only for use on fires in ordinary hydrocarbon flammable liquids such as oils, gasoline, benzol, etc. See also Air-foam Systems for Alcohols, Esters, Ketones.

Except as noted, best results are obtained w
nozzle pressure is above 50 psi.

For liquids similar to gasoline, the recomme
foam application rate is 5 gpm/sq ft. The maxim
fire area to be protected by one nozzle is as follows:

	Maximum fire area in sq ft for nozzle at various playpipe pressures: 50 psi	70 psi	100 psi
Foamite 200		55	65 70
600		65	130 135
1200		215	260 270
Fyr-Fyter, Buffalo, Pyrene 16-6		60	80
26-6		60	80
36-6		90	120
36-8F			120
Fyr-Fyter, Buffalo, Pyrene 16-3, 16-6	15	20	30
26-3, 26-6	30	40	60
36-3, 36-6	60	65	90
Kidde, National (K)RP-1½, (K)RP-1½A	15	20	25
(K)RP-3, (K)RP-3A	30	40	50
(K)RP-6, (K)RP-6A	60	80	100
(K)RP-12, (K)RP-12A	115	145	185
Rockwood F301		65	105

For liquids similar to kerosene, the recommend
foam application rate is 2 gpm/sq ft. The maxim
fire area to be protected by one nozzle is as follows:

	Maximum fire area in sq ft for nozzle at various playpipe pressures: 50 psi	70 psi	100 psi
Foamite 200		135	165
600		210	265
1200		645	630
Fyr-Fyter, Buffalo, Pyrene 16-6		100	130
26-6		150	225
36-6		225	340
36-8F			460
Fyr-Fyter, Buffalo, Pyrene 16-3, 16-6	40	55	80
26-3, 26-6	70	100	130
36-3, 36-6	130	165	235
Kidde, National (K)RP-1½, (K)RP-1½A	35	50	70
(K)RP-3, (K)RP-3A	80	95	125
(K)RP-6, (K)RP-6A	150	195	240
(K)RP-12, (K)RP-12A	285	365	460
Rockwood F301		210	300

American LaFrance Elmira N Y

Foamite Air-foam Generating Nozzles. Models 200, 600, 1
with pickup tubes. To be used with Foamite air-foam liquid.

	Pressure at nozzle, psi	Water draft, gpm	Foam liquid draft, gpm	Foam produced, gpm
Model 200	50	22.3	2.15	385
	75	27.5	2.18	505
	100	31.2	2.18	560
Model 600	50	42.5	2.1	455
	75	52.5	3.0	660
	100	60.2	4.1	975
Model 1200	50	91	5.6	1660
	75	108	7.4	1780
	100	128	7.6	1980

Doyle-Protequip Co 36 Chauncey Av Toronto 18 Ont
See listing of National Foam System, Inc.

Fyr-Fyter Co 231 Crane St Dayton 1 O

The following are for use with high-expansion foam compound.

Fyr-Fyter Foam Playpipes. Models FP-16-6, FP-26-6, FP-36-6. Use Fyr-Fyter compound.

Buffalo Foam Playpipes. Models BP-16-6, BP-26-6, BP-36-6 with pick-up tubes. Use Buffalo compound.

Pyrene Foam Playpipes. Models PP-16-6, PP-26-6, PP-36-6 with pick-up tubes. Use Pyrene compound.

Pyrene Foam-playpipe. Model PP-35-8F. Pre-mixed-solution type. Use Pyrene compound.

Pyrene Foam Dual Proportioning Tank. Model PPT-10[illegible] Use Pyrene compound.

	Pressure at playpipe, psi	Water draft, gpm	Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
	50	14.0	0.65	195	30
	75	17.0	0.80	280	40
	100	19.5	0.95	340	47
	125	21.0	0.95	320	46
	50	26.0	1.35	410	30
	75	30.5	1.47	600	40
	100	35.0	1.53	640	46
	125	39.5	1.55	640	45
	50	37.0	1.50	550	30
	75	44.0	1.72	750	42
	100	51.0	1.75	900	52
	125	56.0	1.80	1000	60
	75	51.5	2.0	900	52
	100	57.0	2.5	1100	60
	125	62.5	4.0	1300	65

The following are for use with 3% low-expansion foam compound.
Fyr-Fyter Foam Playpipe. Models FP-16-3, FP-26-3, FP-36-3. Use Fyr-Fyter compound.
Buffalo Foam Playpipe. Models BF-16-3, BF-26-3, PP-36-3, with pick-up tubes. Use Buffalo compound.
Pyrene Foam Playpipe. Models PP-16-3, PP-26-3, PP-36-3, with pick-up tubes. Use Pyrene compound.
Pyrene Foam Playpipe. Models PP-16-S, PP-26-S, PP-36-S. For use with proportioner. Use Pyrene compound.

	Pressure at playpipe, psi	Water draft, gpm	Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
	20	12.5	0.5	75	10
	50	18.4	0.5	105	18
	75	18.5	0.5	160	22
	100	21.0	0.5	160	27
	20	24.5	1.2	145	10
	50	38.3	1.2	205	15
	75	34.4	1.2	240	25
	100	39.0	1.2	280	33
	20	37.5	1.6	200	10
	50	44.5	1.6	325	18
	75	52.0	1.6	465	25
	100	58.5	1.6	515	30

Kidde & Co Inc 675 Main St Belleville N J

Kidde Mechanical Foam Playpipe. Models KRP-1½, KRP-2, KRP-2A, KRP-6, KRP-6A, KRP-12, KRP-12A. For use with pick-up tubes or proportioner. Model numbers ending in A pick up the correct proportion of 3% Kidde foam liquid. Models others pick up the correct proportion of regular 6% Kidde foam liquid.

Kidde Pressure Proportioner. Type KPP-D10-V. For use with regular 6% Kidde foam liquid and approved Kidde foam-making device with solution draft not over 90 gpm. Requires 75 psi or more at proportioner for best operation.

	Pressure at playpipe, psi	Water draft, gpm	Regular 6% foam liquid draft, gpm	3% Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
Models KRP-1½, 1½A	30	7.5	0.7	0.2	75	23
	50	10.0	0.8	0.4	100	30
	75	12.5	0.9	0.5	140	32
	100	14.8	1.0	0.5	150	35
Models KRP-2, 2A	30	16.7	1.7	0.5	155	20
	50	21.7		0.8	185	30
	75	27.0		1.1	245	40
	100	30.7	1.9	1.1	290	48
Models KRP-6, 6A	30	34.0	2.2		305	14
	50	44.5	2.5	1.4	395	35
	75	54.2	3.1		480	51
	100	61.0	3.8	2.1	570	58
Models KRP-12, 12A	30	66.0	5.9		570	21
	50	86.0		3.9	730	33
	75	103.0			920	51
	100	117.5	7.2	3.9	1100	62

National Foam System Inc West Chester Pa

National Aer-O-Foam Nozzle. Models RP-1½, RP-1½A, RP-2, RP-2A, RP-6, RP-6A, RP-12, RP-12A for use with pick-up tubes or proportioner.

National Aer-O-Foamster. Models FS-1½, FS-1½A. Use with rubber hose.

Model numbers ending in A pick up the correct proportion of National Aer-O-Foam 3% liquid. The others pick up the correct proportion of regular 6% National Aer-O-Foam liquid.

National Aer-O-Foam Pressure Proportioner. Type PP-D10-V. For use with regular 6% National Aer-O-Foam liquid and approved National Aer-O-Foam foam-making device with solution draft not over 90 gpm. Requires 75 psi or more at proportioner for best operation.

	Pressure at playpipe, psi	Water draft, gpm	Regular 6% foam liquid draft, gpm	3% Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
Models RP-1½A, RP-1½	30	7.5	0.7	0.2	75	23
	50	13.0	0.8	0.4	130	30
	75	13.5	0.9	0.5	140	33
	100	14.8	1.0	0.5	150	35
Models RP-2A, RP-2	30	16.7	1.7	0.5	155	20
	50	21.7		0.8	185	30
	75	27.0		1.1	245	40
	100	30.7	1.9	1.1	290	48
Models RP-6A, RP-6	30	34.0	2.2		305	14
	50	44.5	2.5	1.4	395	35
	75	54.2	3.1		480	51
	100	61.0	3.8	2.1	570	58
Models RP-12A, RP-12	30	66.0	5.9		570	21
	50	86.0		3.9	730	33
	75	103.0			920	51
	100	117.5	7.2	3.9	1100	62

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto 8 Ont
See listing of Fyr-Fyter Co.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass

Rockwood Foam Nozzle. F-301. 1½ in. With pick-up tube. To be used with Rockwood mechanical-foam liquid.

Pressure at nozzle, psi	Water draft, gpm	Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
50	30.0	2.21	435	37
75	42.0	3.46	533	53
100	54.0	5.51	666	66

AIR-FOAM EQUIPMENT, for Alcohols, Esters, Ketones

The portable air-foam equipment listed below is approved for use in producing foam for fires in alcohols, esters and ketones. It is not recommended for fires in ordinary hydrocarbon flammable liquids such as oils, gasoline, benzol, etc.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Fyr-Fyter Foam Playpipe. Models FP-16-A, FP-26-A, FP-36-A, with pick-up tubes. For use with Fyr-Fyter 6% alcohol-resistant foam compound.

Buffalo Foam Playpipe. Models BF-16-A, BF-26-A, BF-36-A, with pick-up tubes. For use with Buffalo 6% alcohol-resistant foam compound.

Pyrene Foam Playpipe. Models PP-16-A, PP-26-A, PP-36-A, with pick-up tubes. Models PP-16-A, PP-26-A, PP-36-A, with pick-up tubes. Models PP-16-S, PP-26-S, PP-36-S, for use with proportioner. All for use with Pyrene 6% alcohol-resistant foam compound.

	Pressure at playpipe, psi	Water draft, gpm	Foam liquid draft, gpm	Foam produced, gpm	Range of foam stream, ft
Models 16-A, 16-S	50	15.4	1.3	130	18
	75	18.5	1.3	145	27
	100	21.0	1.3	160	37
Models 26-A, 26-S	50	20.3	2.5	180	18
	75	24.4	2.5	225	32
	100	28.0	2.5	245	38
Models 36-A, 36-S	50	44.5	4.0	340	18
	75	55.0	4.0	435	32
	100	58.5	4.0	525	38

Recommended application rate, 5 gpm. The maximum fire area in sq ft to be protected by one nozzle at various playpipe pressures is as follows:

	60 psi	75 psi	100 psi
Model 10-A	35	50	55
20-A	55	65	70
30-A	75	85	100

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto 8 Ont
See listing of Fyr-Fyter Co.

VAPORIZING-LIQUID EXTINGUISHERS

Approved types of vaporizing liquid extinguishers contain at least two quarts of liquid charge which is expelled from the extinguisher by (1) a manually operated pump or (2) by stored air, nitrogen, or carbon dioxide pressure.

These extinguishers are suitable for use on incipient Class A fires and on fires in electrical apparatus, the liquid being a nonconductor. See also separate listing under "Vaporizing Liquid Extinguishers for Flammable Liquid Fires."

Vaporizing liquids used in these extinguishers will not freeze at temperatures as low as −50° F.

The corrosive nature of the fumes liberated when the vaporizing liquid is used on fires should be considered where fine tools or precision metal parts would be affected by corrosion. Avoid fume inhalation.

These extinguishers are approved only when charged with the manufacturer's specified recharge liquid, taken from previously unopened containers. Extinguishers should be kept fully charged at all times and should not be subjected to normal temperatures in excess of 110° F. nor exposed to humid or corrosive atmospheres.

The use of vaporizing liquid extinguishers may be prohibited by law in some states.

American LaFrance Elmira N Y
Fire Gun. Model No. 2. 1 gal. Air-pressure type without built-in pump.
Fire Gun. Model No. 4. 1 gal. Air-pressure type with built-in pump.
Fire Gun. Model 8. 2 gal. Air-pressure type with built-in pump.
Valax. ½ gal. Air-pressure type without built-in pump.

Fyr-Fyter Co 221 Crane St Dayton 1 O
Fyr-Fyter Model B. Model 12-1. 2 qt. Stored-pressure type.
Fyr-Fyter Model CB. Model 12-3. 2 qt. Stored-pressure type. Bromochloromethane.
Captain. 1 gal. Pump type.
Central Station. 1, 2 gal. Pump type.
Fyr-Fyter. Model No. 24-6. 1 gal. With pump. Stored-pressure type.
Buffalo Better Built. Model No. 24-7. 1 gal. With pump. Stored-pressure type.
Buffalo Better Built Air-Flo. 1 gal. Pump type.
Buffalo. 1, 2 gal. Pump type.
Buffalo Better Built. Model 12-4. 2 qt. Stored-pressure type. Bromochloromethane.
Buffalo Better Built. Model 12-2. 2 qt. Stored-pressure type.
Pyrene. Model No. C105P. ½ gal.
Pyrene. Model No. C45P. 1 gal.
Pyrene. 2 qt, 1 gal. With or without pump. Double-[illegible] Air-pressure type.

Fyr-Fyter Co of Canada Ltd 136 Manitoba St Toronto 13 [illegible]
Fyr-Fyter Model B. Model 12-1. 2 qt. Stored-pressure [illegible]
Fyr-Fyter Model CB. Model 12-3. 2 qt. Stored-pressure type. Bromochloromethane.
Captain. 1 gal. Pump type.
Central Station. 1, 2 gal. Pump type.

Phister Mfg Co 621 E Pearl St Cincinnati 2 O
Phister. ½ gal (without pump), 1 gal (with or without pump), 3 gal (with pump). Air-pressure type.

Stop-Fire Inc U S Highway No 1 New Brunswick N J
Stop-Fire. Model AP-24. 2½ qt. Stored-pressure type.
Stop-Fire Redi-Grip. Models AC-24 (2½ qt), AC-32 (3 qt). Stored-pressure type.
Stop-Fire Redi-Grip. Models AB-24 (2½ qt), AB-32 (3 qt). Stored-pressure type. Bromochloromethane.

VAPORIZING-LIQUID EXTINGUISHERS, for Flammable Liquids

The following specially designed vaporizing liquid extinguishers have been found by test to be suitable for use on fires involving small quantities of volatile flammable liquids such as gasoline, in open containers, as well as fires involving electrical equipment.

A 6 in. freeboard above the liquid surface is required for maximum effectiveness. Under favorable conditions nonexpert operators should be able to extinguish open-tank gasoline fires of 1 sq. ft. area with extinguishers of less than 3 qt. capacity, and 2 sq. ft. area with extinguishers of 3 qt. or greater capacity.

Avoid inhalation of fumes. The use of vaporizing liquid extinguishers may be prohibited by law in some states.

Stop-Fire Inc U S Highway No 1 New Brunswick N J
Stop-Fire Redi-Grip. Models AQ-20 (1 qt), AQ-32 (1½ qt), AQ-24 (2½ qt), AQ-36 (1 gal). Stored-pressure type. Bromochloromethane.

DRY COMPOUND

The extinguishing agent listed below is approved for use in extinguishing small fires in magnesium, powdered aluminum, zinc, zirconium, sodium, and potassium. A single pail of powder should be sufficient to extinguish a fire involving approximately ten pounds of metal. The powder is generally applied with a shovel, covering the burning metal with a layer at least 1½ inches deep. If the fire is on a wood floor, it is necessary to spread a layer of extinguishing powder on the floor near the burning metal, cover the metal, and then shovel the whole mass onto the layer of powder, re-covering with more powder.

Ansul Chemical Co Fire Equipment Div Marinette Wis
Met-L-X Dry Powder. 50-lb pails.

...Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor)
...Vaughan Rd Toronto 10 Ont
...L-X Dry Powder. 50-lb pails.

...Co 221 Conno St Dayton 1 O
...Fire Extinguishing Powder. 40-lb pails, 325-lb drums.
...Mfg Co of Canada Ltd 91 E Don Roadway Toronto 8 Ont
...Fire Extinguishing Powder. 40-lb pails, 350-lb drums.

...-COMPOUND EXTINGUISHERS

...tinguishers are intended for use on fires ...ving magnesium chips and turnings, sodium, ...ium and sodium-potassium alloys.
...fire involving 5 lbs. of magnesium chips or 2 sq. ft. ...id sodium, potassium, or sodium-potassium alloy ...be controlled and extinguished by a 30-lb. extin-...isher. Larger fires may require the use of 150-lb. ...50-lb. wheeled extinguishers which have a greater ...city and longer range.
...erally, proper fire protection of flammable-metal ...ards merits individual consideration, and the recom-...dations of the Factory Mutual Engineering Division ...ld be requested.

Ansul Chemical Co Fire Equipment Div Marinette Wis
Met-L-X. Models-30-B (30 lb), -150-B (150 lb), -350-B (350 lb).
Approved for use with Ansul Met-L-X dry-compound powder.

Ansul Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor)
747 Vaughan Rd Toronto 10 Ont
Met-L-X. Models-30-B (30 lb), -150-B (150 lb), -350-B (350 lb).
Approved for use with Ansul Met-L-X dry-compound powder.

HYDROSTATIC TEST PUMP

A manually operated pump for testing fire-protective equipment. Pressure tests will show the tightness of automatic sprinkler systems, and the condition of portable chemical extinguishers and chemical engines.

The approved pedestal-type pump is arranged to take suction from any source of water through a ¾-in. coupling, and to discharge through special adapters supplied with the pump. A hose and clamp connection is used for testing ordinary extinguishers.

Be sure to remove all air from the system to prevent accidents if the container should rupture.

American LaFrance Elmira N Y
Tustall Hydrostatic Test Pump.

[fol. 1642]

FIXED EXTINGUISHING SYSTEMS

CARBON DIOXIDE SYSTEMS

Carbon dioxide systems are of two general types, high pressure and low pressure. In high pressure systems the carbon dioxide is stored at ambient temperature in cylinders, while in the low pressure systems the carbon dioxide is stored at 0°F. in refrigerated tanks. These cylinders or tanks are connected to a distributing system of fixed pipe with horns and/or nozzles for discharging gas into the hazard to be protected. The carbon dioxide is discharged manually or automatically.

The method of application, quantity of gas, and the time of discharge depend upon the hazard protected. The use of a properly designed and well-maintained carbon dioxide system eliminates loss due to water or damage from other extinguishing agents, and greatly reduces interruption of production. Adequate reserve protection consisting of sprinklers or other suitable protection should generally be provided. In cases where the system is not backed up by an approved sprinkler system, the control equipment of the carbon dioxide system should be supervised in a manner equivalent to that required for approved supervised special sprinkler systems.

Contracts for fixed carbon dioxide protection should be let subject to Factory Mutual acceptance, obtained by the manufacturer prior to installation. Drawings showing all installation details and a complete description of the hazard should be submitted to the Factory Mutual Engineering Division, as well as information regarding auxiliary features which may affect the operation of the system.

CARBON DIOXIDE SYSTEMS, Total Flooding

The following systems are suitable for the protection of enclosed special hazards such as rooms or spaces containing flammable liquids or flammable liquid operations, spaces containing electrical equipment such as transformers and oil switches, for enclosed generators, and for record vaults, fur storage and hops storage, where a fire would be of such a nature as to be readily extinguished by inert gas. Devices are provided in the system for closing shutters, doors, windows, dampers, stopping blowers, etc. in order to confine the inert gas. This protection is generally called total flooding.

Where values warrant, the systems may be used for primary protection of certain ordinary combustible materials where a concentration of gas can be maintained and where a suitable secondary protection provided.

American LaFrance Elmira N Y

Alfite High-pressure Systems. Models OL, OFV, OF, OFS, OFV, OM, OMV for enclosed spaces. Models OLVR, OER, OEVR, OFR, OFVR, OMR, OMVR for electrical machinery.

Cardox Div Chemetron Corp 840 N Michigan Av Chicago

Cardox High-pressure System.

Cardox Low-pressure System. Type M (manually operated). Type A (automatically operated). Low-pressure storage refrigerated carbon dioxide at 0°F in tanks of one-ton capacity and greater.

C-O-Two Fire Equipment of Canada Ltd 91 E Don Road Toronto Ont

C-O-Two.

Fyr-Fyter Co 221 Crane St Dayton 1 O

C-O-Two High-pressure Systems.

C-O-Two Low-pressure System. Automatic and/or manual Low-pressure storage of refrigerated carbon dioxide at 0°F in tanks of one-ton capacity and greater.

C-O-Two Carbon Dioxide Self-contained Units. Type [illegible] Single cylinders of carbon dioxide arranged for automatic operation in a standardized integral assembly. Mounted in space to be protected. Automatic operation of valve caused by [illegible] Quartsoid-bulb unit. The two sizes of units available are charged with 2 and 4 lb of carbon dioxide when fitted with 135 or [illegible] Quartsoid bulbs and 1½ and 3 lb of carbon dioxide when fitted with 250°F Quartsoid bulbs.

Walter Kidde & Co Inc 675 Main St Belleville 9 J

Kidde High-pressure Systems. Single cylinder of 10-, 15-, 25-, 35-, 50-, 75-, 100-lb capacity, or multiples of 50-, 75-, [illegible] Self-contained rate-of-rise automatic systems and electric automatic systems available. Equipment adaptable for multiple protection by valving arrangement from single bank of cylinders.

Walter Kidde & Co of Canada Ltd 5500 Royalmount Av Montreal 9 P Q

Kidde High-pressure Systems.

Randolph Laboratories Inc 8 E Kinzie St Chicago 11 Ill

Randolph High-pressure Systems. Models AE (automatic electric), AM (automatic mechanical with fusible link), AM H.A. (automatic mechanical with heat-actuating devices), M (manual

CARBON DIOXIDE SYSTEMS, Local Application

The following systems are suitable for the protection of unenclosed special hazards such as dip tanks, drain boards, etc. where a fire would be of such a nature as to be extinguished by inert gas. Devices are also provided in the system for stopping conveyors and other machinery involved in the hazard in order to confine

hazards within the limits of protection. This type system is generally called local application.

Dir Chemetron Corp 840 N Michigan Av Chicago Ill
Low-pressure System. Type M (manually operated). A (automatically operated). Low-pressure storage of carbon dioxide at 0°F in tanks of one-ton capacity

Kidde & Co Inc 675 Main St Belleville N J
High-pressure Systems.

Kidde & Co of Canada Ltd 3500 Royalmount Av Montreal 16 PQ
High-pressure Systems.

Laboratories Inc 8 E Kinzie St Chicago 11 Ill
High-pressure System. Model AE (automatic mechanical with fusible link). AM H.A.D. mechanical with heat-actuating devices). M (manual).

CHEMICAL SYSTEMS

A dry chemical extinguishing system consists of a container of dry chemical connected by fixed piping nozzles. The dry-chemical is discharged when the container is pressurized by a gas released either automatically or manually from an associated container.

The systems are intended primarily to protect flammable liquid hazards. This is done by "total flooding" an entire room or enclosure containing the hazard or "local application" of the dry chemical directly onto hazard by overhead or tankside nozzles. In either the extinguishing effect of dry chemical is such a lingering ignition source can re-ignite the hazard immediately after the original extinguishment after end of discharge.

Adequate reserve protection consisting of sprinklers or other suitable protection should generally be provided. Because the dry chemical flowing through pipe consists of suspended solid particles in a gaseous medium, its characteristics do not follow conventional fluid flow laws. However, the characteristics have been determined experimentally. System design is a specialized matter and it is very important that the recommended limitations regarding pipe size, length, symmetry and arrangement as well as nozzle spacing and location be followed carefully.

Plans and all details of a proposed system should be submitted to the Factory Mutual Engineering Division for review and acceptance prior to installation.

Chemical Co Fire Equipment Div Marinette Wis
Dry-chemical System. Models PS-150-B (150 lb), PS-300-B (300 lb), PS-500-B (500 lb).
Dry-chemical System. Model PS-30-B (30 lb). A packaged system designed for customer installation. Consists essentially of a Model PS-30 dry-chemical chamber, carbon dioxide cartridge and puncturing mechanism, union-held rupture disc at the chamber outlet, discharge piping and two nozzles. Automatic operation is provided by heat-actuated detector and release assemblies with associated cable and pulleys. Remote manual operation is provided by a pull station also connected to the release by cable. Manual operation is also possible at the chamber. A switch is available for alarm or equipment shutdown when the system operates.

Ansul Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor) 747 Vaughan Rd Toronto 10 Ont
See listings of Ansul Chemical Co.

DRY-CHEMICAL SYSTEM, Hand-hose Line

Hand-hose line systems consist of fixed containers of dry chemical connected by fixed piping to hose stations near the hazard. The ¾- or 1-in. hose is supplied in 50-, 75-, or 100-ft lengths. The system can be remote controlled at the station.

Ansul Chemical Co Fire Equipment Div Marinette Wis
Ansul Dry-chemical Hand-hose-line Systems. Models S-150-A (150 lb), S-350-A (300 lb), S-500-B (500 lb), S-1000-B (1000 lb), S-2000-C (2000 lb).

Ansul Chemical Co (mfr) Levitt-Safety Ltd (Canadian distributor) 747 Vaughan Rd Toronto 10 Ont
Ansul Dry-chemical Hand-hose-line Systems. Models S-150-A (150 lb), S-350-A (300 lb), S-500-B (500 lb), S-1000-B (1000 lb), S-2000-C (2000 lb).

Pyr-Fyter Co 221 Crane St Dayton 1 O
Dry-chemical Hand-hose-line Systems. Types DCHU-150, DCHU-300, DCHU-500. Consist of a container holding 150, 300, or 500 lb of dry chemical, pressure regulator for cylinder nitrogen supply, control valves, piping, hose rack, hose, nozzle(s), and remote operating provisions. 50-, 75-, or 100-ft lengths of ¾- or 1-in. hose are used, depending on DCHU size. Up to 25 ft of 1¼-in. pipe may be used between the stationary equipment and the hose rack; 5 elbows maximum allowable. Nozzles are Part Nos. 82800 and 82806 (2-position), and 90015 and 89980 (3-position).

Walter Kidde & Co Inc 675 Main St Belleville N J
Kidde Dry-chemical Hand-hose-line Systems. Models 200DCPS (200 lb), 400DCPS (400 lb).

FOAM SYSTEMS

Fixed foam installations consist of foam-producing units attached to permanently piped systems discharging through nozzles, and arranged to operate automatically, with provision also for manual operation.

Where these systems are used for indoor tanks containing flammable liquids, automatic sprinklers or other suitable protection should also be provided, and the tanks equipped with trapped overflow drains.

Contracts for fixed foam protection should be let subject to Factory Mutual acceptance, obtained by the manufacturer prior to installation. Drawings showing the installation details and a complete description of the hazard should be submitted to the Factory Mutual Engineering Division for review, as well as information regarding auxiliary features which may affect the operation of the system.

Each foam extinguisher and its charge is approved as a unit, and therefore the trade name and manufacturer of the extinguisher should be specified in purchas-

ing foam ch[illegible] Directions with the charge should be followed carefully.

CHEMICAL-FOAM SYSTEMS

American LaFrance Elmira N Y

Automatic Foamite Extinguisher. Models RT-3, RT-3F, 12 gal. Pump discharge. Not for piped systems. For use on flammable liquids of 150°F open-cup flash point or higher.

Foamite Systems. Models STA10, STA40. Consist of the STA10 (L, F or M) or STA40 (L, F or M) Foamite unit with nozzles and associated balanced piping. A standard system uses eight nozzles of one or more of the following types:

STA10	Flared nozzle No. 35FS-231	¾ in. ips	Orifice ⅜ in. diameter
STA10	Deflector nozzle No. 35FS-307	¾ in.	⅜ in.
STA10	Distributor nozzle No. 31FS-1311	¾ in.	⅜ in.
STA40	Flared nozzle No. 23FE-167	1 in.	1 in.
STA40	Deflector nozzle No. 31FS-200	1¼ in.	1 in.
STA40	Distributor nozzle No. 31FS-1310	1¼ in.	1 in.*

* Area equivalent to 1-in. circular orifice.

The distance from the Foamite-unit tee to each nozzle should be 10 to 25 ft in the STA10 system, 15 to 50 ft in the STA40 system.

CHEMICAL-FOAM SYSTEMS, for Hot Oils, Asphalt

The foam equipment below, together with the ordinary foam charge, is suitable for use on fires in hot oils or asphalts (above 250°F) without causing boilover.

American LaFrance Elmira N Y

Automatic Foamite Extinguisher. Models ST-10 (10 gal with nozzle No. 31FS1085), ST-40 (35 gal with nozzle No. 31FS1084). Both models used with fixed piping system with foam discharge through appropriate Foamite distributor nozzles located above the hazard.

AIR-FOAM SYSTEMS

Fyr-Fyter Co 221 Crane St Dayton 1 O

Pyrene Premix Foam Maker. Nos. 2, 4, 6. With built-in vapor seals. For use with Pyrene high-expansion foam compound and water at pressures not less than 50 psi supplied from suitable proportioner or from premixed solution storage tank. Characteristics and recommended maximum fire areas to be protected at the recommended foam-application rate of 1.25 gpm/sq ft are shown in the table:

	Pressure at foam maker, psi	*Total liquid draft, gpm*	*Foam liquid draft, gpm*	*Foam produced, cfm*	*Max foamable-liquid fire area to be protected by one unit, sq ft*
Model 2	50	29.1	1.75	465	370
	75	34.7	2.08	555	450
	100	39.9	2.40	640	510
	125	45.0	2.70	720	580
Model 4	50	57.7	3.46	925	740
	75	70.7	4.25	1130	910
	100	81.4	4.88	1300	1040
	125	90.0	5.40	1440	1150
Model 6	50	87.9	5.27	1410	1130
	75	108.4	6.32	1690	1350
	100	121.7	7.30	1950	1560
	125	135.5	8.13	2170	1740

Pyrene Stationary Proportioning Tanks. Models PPT-10-3 (10 gal), PPT-20-3 (20 gal), PPT-40-3 (40 gal).

Pyrene Portable Wheeled Proportioning Tanks. Models PPT-20W-3 (20 gal), PPT-40W-3 (40 gal).

Pyrene Foam Dual Proportioning Tank. Model PPT-10D.

Pyrene Auto-induction System. Auto-induction Foam [illegible] Nos. 6, 8, 10, 12. For use with Pyrene high-expansion foam compound and water at pressures not less than 75 psi. Characteristics and recommended maximum fire areas to be protected [illegible] at the recommended foam-application rate of 1.25 gpm/sq ft are shown in the table:

	Pressure at foam maker, psi	*Water draft, gpm*	*Foam liquid draft, gpm*	*Foam produced, cfm*	*Max foamable-liquid fire area to be protected by one unit, sq ft*
Model 6	75	102	6.25	1730	[illegible]
	100	118	6.38	2000	
	125	130	6.50	2180	
Model 8	75	140	7.00	2360	
	100	160	8.40	2700	
	125	174	9.35	2900	
Model 10	75	179	9.87	3000	
	100	206	10.00	3500	
	125	228	11.15	3820	
Model 12	75	204	10.30	3420	
	100	237	11.50	4000	
	125	258	12.14	4300	

Pyrene Pressure-line Induction System. Solution Foam [illegible] Nos. 6, 8, 10, 12. For use with Pyrene high-expansion foam compound and water at pressures not less than 75 psi. Characteristics and recommended maximum fire areas to be protected [illegible] recommended foam-application rate of 1.25 gpm/sq ft [illegible] in the table:

	Pressure at foam maker, psi	*Total liquid draft, gpm*	*Foam liquid draft, gpm*	*Foam produced, cfm*	*Max foamable-liquid fire area to be protected by one unit, sq ft*
Model 6	75	105	6.25	1670	
	100	118	6.69	1880	
	125	129	6.75	2040	
Model 8	75	141	8.40	2220	
	100	162	9.37	2600	
	125	185	11.14	2940	
Model 10	75	169	10.70	2700	
	100	192	12.20	3080	
	125	212	13.60	3380	
Model 12	75	201	14.08	3220	
	100	230	15.68	3680	
	125	253	16.70	4000	

Pyrene Solution Foam Makers. Nos. 2, 4, 6, 8, 10, 12. Pressure not less than 50 psi. For use with Pyrene 3% low-expansion foam compound. There are two kinds of applications. Type I consists of outlet piping discharging into a Pyrene foam trough. Type II consists of outlet piping directing discharge against tank [illegible] Characteristics and recommended maximum fire areas to be protected are shown in the table:

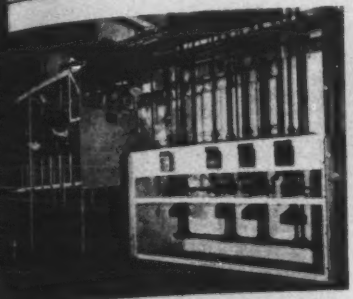
	Pressure at foam maker, psi	*Total solution draft, gpm*	*Foam produced, cfm*	*Max foamable-liquid area to be protected by one unit, sq ft*	
				Type I application. Foam application rate, 1.0 gpm/sq ft	*Type II application. Foam application rate, 1.25 gpm/sq ft*
Model 2	50	29.3	340	340	300
	75	36.0	390	390	250
	100	41.5	435	435	270
Model 4	50	54.0	630	630	415
	75	66.0	635	635	510
	100	74.0	685	685	555
Model 6	50	83.0	745	745	595
	75	106.8	1025	1025	820
	100	123.0	1160	1160	930
Model 8	50	116.3	1320	1320	1060
	75	139.0	1485	1485	1190
	100	164.0	1640	1640	1310
Model 10	50	141.0	1555	1555	1240
	75	173.3	1955	1955	1565
	100	197.2	2220	2220	1780
Model 12	50	176.0	2015	2015	1610
	75	214.0	2065	2065	1650
	100	247.0	2540	2540	2030

Pyrene Proportioning Tanks. Models PPT-10-D-3-3 (dual 10-gal tanks), PPT-10-3-3 (10 gal), PPT-20-3-3 (20 gal), PPT-40-3-3 (40 gal), PPT-20-6-3 (20 gal), PPT-40-6-3 (40 gal).

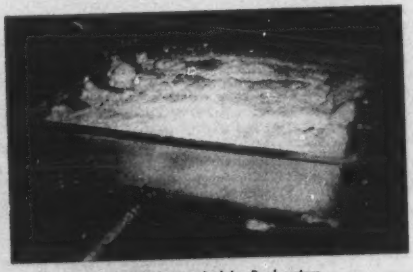
Pyrene Pressure-line Induction System. Inductors Nos. 6/8-10/12-3.

Walter Kidde & Co 675 Main St Belleville N J

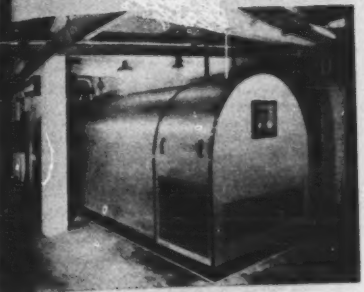
Kidde Foam Chambers and Foam Makers. Types KMC-[illegible] -12, -24, -36, KMCC-6, -12, -24, -36, KML-12, -24, -36, KMLC-[illegible]



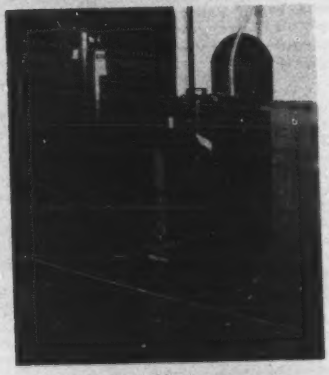
Carbon-dioxide cylinders, high-pressure system.



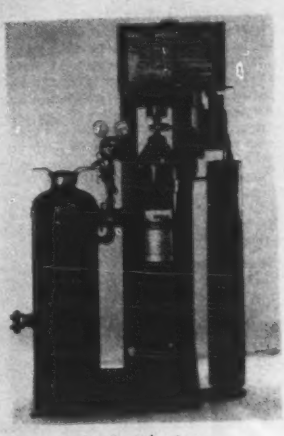
Foam blanket applied by fixed system.



Carbon-dioxide storage tank, low-pressure system.



Chemical-foam system.



Dry-chemical system.

Water-spray system.

-24, -36. All approved for use with a premixed solution of regular 6% Kidde foam liquid and water. KML and KMLC approved also for use with a premixed solution of 3% Kidde foam liquid and water. All units are used for the protection of flammable-liquid storage tanks. Premixed solution to be supplied at pressures between 50 and 100 psi from suitable proportioner or from a premixed-solution storage tank. KMC and KMCC are Type II foam applicators, KML and KMLC are Type I. Foam application rate for KMC units to be at least 1.25 gpm/sq ft, for KML units at least 1.0 gpm/sq ft. Total liquid draft, foam volumes and recommended maximum fire areas to be protected are shown in the table:

	Pressure at foam maker, psi	*Total liquid draft, gpm*	*Foam volume, gpm*	*Max fire area to be protected by one unit, sq ft*
KMC (or CC)-6	50	42.5	425	340
	100	60	600	480
KMC (or CC)-12	50	85	850	680
	100	120	1200	960
KML (or LC)-12	50	85	850	680
	100	120	850	680
KMC (or CC)-24	50	170	1700	1360
	100	240	2400	1920
KML (or LC)-24	50	170	1200	1200
	100	240	1780	1780
KMC (or CC)-36	50	255	2550	2040
	100	360	3600	2880
KML (or LC)-36	50	255	1800	1800
	100	360	3000	3000

Kidde Pump Proportioners. Models KE60N, KE60NA, KS60N, KS60NA, KF60N, KF60NA, KT60N, KT60NA, KO60N, KO60NA, KO30N, KO30NA, KO15N, KO15NA. Models A are for use with 3% Kidde foam liquid, others with regular 6% Kidde foam liquid. Approved for portable service with proper-size foam-making devices and for piped systems using proper-size Kidde foam chambers and foam makers.

Kidde Pressure Proportioner. Type KPP-D10-V. Approved for use with regular 6% Kidde foam liquid and approved foam-making devices with total liquid drafts not over 90 gpm. Requires 75 psi or more at proportioner for best operation.

Kidde Autofoam Self-contained Air-foam Units. Models KB-33 (33 gal), KB-66 (66 gal), KB-100 (100 gal), KB-200 (200 gal). Types A (local manual), B (local manual, remote manual), C (local manual, remote manual, automatic), D (local manual, automatic), approved for use with regular 6% Kidde foam liquid and proper-size foam-making devices.

Kidde Foam Makers. Models KSS-1½A, B, C, KSS-3A, B, C, KSS-6A, B, C. To be used with Kidde dip-tank deflector boxes, KSD-1½F, -3F, -6F, with Kidde drainboard deflector boxes, KSD-1½H, -3H, -6H, or with Kidde overhead spray deflector nozzles, KSD-1½B, -3B, -6B. Foam-maker models ending in A pick up correct proportion of regular 6% Kidde foam liquid at the foam maker. Foam-maker models ending in B are approved for use either with regular 6% Kidde foam liquid or with 3% Kidde foam liquid, the foam liquid being introduced to the water stream by a suitable proportioning device before reaching the foam maker. Foam-maker models ending in C pick up the correct proportion of 3% Kidde foam liquid at the foam maker. Water draft, foam-liquid draft, foam volumes, and maximum fire areas to be protected are shown in the tables:

Foam maker and deflector	*Pressure at foam maker, psi*	*Water draft, gpm*	*Regular 6% Kidde foam liquid draft, gpm*	*3% Kidde foam liquid draft, gpm*	*Foam volume, gpm*
KSS-1½A, B, or C KSD-1½F	50	8.0	0.48	0.40	65
	50	10.5	0.63	0.42	105
	75	12.5	0.75	0.43	115
	100	14.5	0.87	0.39	130
KSS-3A, B, or C KSD-3F	50	17.6	1.06	0.60	100
	50	23.0	1.38	0.95	160
	75	27.3	1.64	1.00	200
	100	31.5	1.84	0.98	200
KSS-6A, B, or C KSD-6F	50	33.2	2.04	1.30	300
	50	41.3	2.48	1.73	400
	75	50.6	3.04	1.90	490
	100	58.4	3.40	1.93	525

Maximum dip-tank fire area in sq ft to be protected by one foam maker and deflector box. Foam application rate 1.0 gpm/sq ft.

Pressure at foam maker, psi	*KSS-1½A, B, or C KSD-1½F*	*KSS-3A, B, or C KSD-3F*	*KSS-6A, B, or C KSD-6F*
50	65	100	200
90	105	160	320
75	115	200	400
100	130	200	400

Maximum width in ft of drainboard surface to be protected by one foam maker and deflector box. Based on tests with deflector mounted flush with rear of drainboard at an angle of 11° with the horizontal.

Pressure at foam maker, psi	*KSS-1½A, B, or C KSD-1½ H*	*KSS-3A, B, or C KSD-3H*	*KSS-6A, B, or C KSD-6 H*
30	3½	4	5½
50	4½	5	7
75	5½	7	7-8
100	6	9	8-9

Maximum circular area in sq ft to be protected by one foam maker and overhead spray deflector nozzle. Based on tests with nozzles in pendent position 8 ft above horizontal plane.

Pressure at foam maker, psi	*KSS-1½A, B, or C KSD-1½B*	*KSS-3A, B, or C KSD-3B*	*KSS-6A, B, or C KSD-6B*
30	*	*	115
50	*	*	175
60	90	125	195
75	113	155	270
100	155	200	315

* Foam dispersion unsatisfactory at these pressures.

Maximum recommended spacing in ft between overhead spray deflector nozzles:

Pressure at foam maker, psi	*KSS-1½A, B, or C KSD-1½B*	*KSS-3A, B, or C KSD-3B*	*KSS-6A, B, or C KSD-6B*
30	*	*	8.5
50	*	*	10.5
60	7.0	9.0	11.5
75	9.5	10.0	13.0
100	10.0	11.5	14.0

* Foam dispersion unsatisfactory at these pressures.

Doyle-Protequip Co 36 Chauncey Av Toronto 18 Ont

See listing of National Foam System, Inc.

National Foam System Inc West Chester Pa

National Aer-O-Foam Foam Chambers and Foam Makers Types MC-6, -12, -24, -36, MCC-6, -12, -24, -36, ML-12, -24, -36, MLC-12, -24, -36. All approved for use with a premixed solution of regular 6% National Aer-O-Foam liquid and water. ML and MLC approved also for use with a premixed solution of 3% National Aer-O-Foam liquid and water. All units are used for the protection of flammable-liquid storage tanks. Premixed solution to be supplied at pressures between 50 and 100 psi from suitable proportioner or from a premixed-solution storage tank. MC and MCC are Type II foam applicators, ML and MLC are Type I. Foam application rate for MC units to be at least 1.25 gpm/sq ft, for ML units at least 1.0 gpm/sq ft. Total liquid draft, foam volumes and recommended maximum fire areas to be protected are shown in the table:

	Pressure at foam maker, psi	*Total liquid draft, gpm*	*Foam volume, gpm*	*Max fire area to be protected by one unit, sq ft*
MC (or CC)-6	50	42.5	425	340
	100	60	600	480
MC (or CC)-12	50	85	850	680
	100	120	1200	960
ML (or LC)-12	50	85	850	680
	100	120	850	680
MC (or CC)-24	50	170	1700	1360
	100	240	2400	1920
ML (or LC)-24	50	170	1200	1200
	100	240	1780	1780
MC (or CC)-36	50	255	2550	2040
	100	360	3600	2880
ML (or LC)-36	50	255	1800	1800
	100	360	3000	3000

...tional Aer-O-Foam Pump Proportioners. Models E60N, ...NA, S60N, S60NA, F60N, F60NA, T60N, T60NA, O60N, ...A, O30N, O30NA, O15N, O15NA. Models A are for use ...3% National Aer-O-Foam liquid, others with regular 6% ...nal Aer-O-Foam liquid. Approved for portable service with ...er-size foam-making devices and for piped systems using ...-size National Aer-O-Foam foam chambers and foam makers. ...tional Aer-O-Foam Pressure Proportioner. Type PP-D10-V. ...proved for use with regular 6% National Aer-O-Foam liquid ...proved foam-making devices with total liquid drafts not ...10 gpm. Requires 75 psi or more at proportioner for best ...ation.

...tional Aer-O-Foam Pressure Pack Self-contained Air-foam ..., Models B-33 (33 gal), B-66 (66 gal), B-100 (100 gal), ...(200 gal). Types A (local manual), B (local manual, ...te manual), C (local manual, remote manual, automatic), ...(local manual, automatic), approved for use with regular 6% ...nal manual liquid and proper-size foam-making devices. ...tional Aer-O-Foam Foam Makers. Models SS-1½A, B, C, ...tional Aer-O-Foam Foam Makers. Models SS-1½A, B, C, ...H, B, C, SS-6A, B, C. To be used with National Aer-O-Foam ...ard deflector boxes, SD-1½F, -3F, -6F, with National Aer-O-...ional Aer-O-Foam overhead spray deflector nozzles, SD-1½B, ...4B. Foam-maker models ending in A pick up the correct ...portion of regular 6% National Aer-O-Foam foam liquid at the ...e maker. Foam-maker models ending in B are approved for ...either with regular 6% National Aer-O-Foam foam liquid or ...3% National Aer-O-Foam foam liquid, the foam liquid being ...livered to the water stream by a suitable proportioning device ...fore reaching the foam maker. Foam-maker models ending in ...ick up the correct proportion of 3% National Aer-O-Foam foam ...id at the foam maker. Water draft, foam-liquid draft, foam ...ume, and maximum fire areas to be protected are shown in ...e below:

Foam maker or deflector	Pressure at foam maker, psi	Water draft, gpm	Regular 6% Aer-O-Foam liquid draft, gpm	3% Aer-O-Foam liquid draft, gpm	Foam volume, gpm
SS-1½A, B, or C	30	8.6	0.48	0.40	65
SD-1½B	50	10.5	0.63	0.42	105
	75	12.5	0.75	0.42	115
	100	14.5	0.87	0.39	130
SS-3A, B, or C	30	17.6	1.06	0.60	160
SD-3B	50	22.0	1.38	0.95	190
	75	27.3	1.64	1.00	200
	100	31.5	1.84	0.98	280
SS-6A, B, or C	30	33.2	2.04	1.30	300
SD-6B	50	41.3	2.48	1.71	400
	75	50.6	3.04	1.90	480
	100	58.4	3.40	1.93	525

...Maximum dip-tank fire area in sq ft to be protected by one foam ...ker and deflector box. Foam application rate 1.0 gpm/sq ft.

Pressure at foam maker, psi	SS-1½A, B, or C SD-1½F	SS-3A, B, or C SD-3F	SS-6A, B, or C SD-6F
30	65	160	300
50	105	190	400
75	115	200	480
100	130	280	575

...Maximum width in ft of drainboard surface to be protected by ...e foam maker and deflector box. Based on tests with box ...ounted flush with rear of drainboard at an angle of 11° with the ...rizontal.

Pressure at foam maker, psi	SS-1½A, B, or C SD-1½ H	SS-3A, B, or C SD-3 H	SS-6A, B, or C SD-6 H
30	3½	4	5½
50	4½	5	7
75	5½	7	7–8
100	6	8	8–9

...Maximum circular area in sq ft to be protected by one foam ...ker and overhead spray deflector nozzle. Based on tests with ...zzles in pendent position 8 ft above horizontal plane.

Pressure at foam maker, psi	SS-1½A, B, or C SD-1½B	SS-3A, B, or C SD-3B	SS-6A, B, or C SD-6B
30	*	*	115
50	*	*	175
60	80	125	205
75	115	155	270
100	155	200	315

...Maximum recommended spacing in ft between overhead spray deflector nozzles.

Pressure at foam maker, psi	SS-1½A, B, or C SD-1½B	SS-3A, B, or C SD-3B	SS-6A, B, or C SD-6B
30	*	*	8.5
50	*	*	10.5
60	7.0	9.0	11.5
75	8.5	10.0	12.5
100	10.0	11.5	14.0

* Foam dispersion unsatisfactory at these pressures.

Pyrene Mfg Co of Canada Ltd 91 E Don Roadway Toronto 8 Ont
See listings of Fyr-Fyter Co.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass

Rockwood Spot-protection Foam Systems. Automatic or manually operated. Foam liquid capacities from 7½ to 200 gal. Proportioners available for total solution drafts from 8 to 275 gpm.

Rockwood Fog-foam Heads. Model TF-39. Nozzle pressure of at least 50 psi required. Solution draft, foam volume, maximum recommended spacing of nozzles, and maximum recommended area to be protected by a single nozzle are as follows:

Pressure at nozzle, psi	Total solution draft, gpm	Foam volume, gpm	Maximum recommended spacing of nozzles, ft	Max recommended circular area to be protected by one nozzle, sq ft
30	30	210	7	80
50	39	340	7	80
75	37	270	7	80
100	41			

Rockwood Foam Maker. 1 in. Solution draft, foam volume, and maximum recommended areas to be protected by one foam maker are as follows:

Pressure at foam maker, psi	Total solution draft, gpm	Nominal foam volume, gpm	Max recommended area to be protected by one foam maker, sq ft
20	8.2	40	40
30	10	50	50
50	13	65	65
75	15.5	90	90
100	18	100	100

Rockwood Foam-maker Chambers. Models 85, 260. Units used for the protection of flammable-liquid storage tanks. Pressure of at least 50 psi required at foam maker. Classified as Type II foam applicators requiring foam application rate of 1.25 gpm/sq ft. Solution draft, foam volume, and maximum recommended areas to be protected by one foam chamber are as follows:

	Pressure at foam maker, psi	Total solution draft, gpm	Foam volume, gpm	Max area to be protected by one unit, sq ft
Model 55	50	58	375	300
	75	70	515	410
	100	81	600	480
Model 260	50	204	1225	980
	75	248	1650	1320
	100	275	1925	1540

All the above are approved for use with Rockwood Regular 6% mechanical-foam liquid or Rockwood double-strength 3% foam liquid.

Rockwood Foam Makers. Models 360, 520, 715. In table, maximum area to be protected is based on Type II application.

	Foam type	Pressure at nozzle, psi	Total solution draft, gpm	Foam volume, gpm	Max recommended area to be protected by one foam maker, sq ft
Model 360	6%	25	168	1450	1160
	6%	50	240	1820	1455
	6%	100	342	2490	2000
	3%	50	240	1680	1345
	3%	100	342	2185	1750

	Foam type	Pressure at nozzle, psi	Total solution draft, gpm	Foam volume, gpm	Max recommended area to be protected by one foam maker, sq ft
Model 520	6%	25	272	2493	2000
	6%	50	386	3245	2600
	6%	100	545	4060	3270
	3%	50	390	2210	1770
	3%	75	465	2510	2010
Model 715	6%	25	372	3180	2540
	6%	50	530	3900	3120
	6%	100	760	5140	4110
	3%	50	510	3520	2820
	3%	100	760	4730	3780

AIR-FOAM SYSTEMS, for Alcohols, Esters, Ketones

The following equipment is approved for use in producing foam for fires in alcohols, esters, and ketones. It is not recommended for fires in ordinary hydrocarbon flammable liquids such as oils, gasoline, benzol, etc.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Pyrene Solution Foam Makers. Nos. 2, 4, 6, 8, 10, 12. Pressure not less than 50 psi. For use with Pyrene 6% low-expansion alcohol-resistant foam compound. Applicator is standard Pyrene outlet piping discharging into foam trough (Type I application).

Pyrene Proportioning Tanks. Models PPT-10-3-A (10 gal), PPT-20-3-A (20 gal), PPT-40-3-A (40 gal), PPT-20-6-A (20 gal), PPT-40-6-A (40 gal).

Pyrene Pressure-line Induction System. Inductors. Nos. 6/8-A, 10/12-A.

Total solution drafts, foam volumes and recommended maximum fire areas to be protected at the recommended foam-application rate of 1.00 gpm/sq ft.

	Pressure at foam maker, psi	Total solution draft, gpm	Foam produced, gpm	Max flammable liquid fire area to be protected by one unit, sq ft
Model 2	50	29.9	400	400
	75	36.0	530	530
	100	41.5	620	620
Model 4	50	54.0	675	675
	75	66.0	940	940
	100	78.0	915	915
Model 6	50	83.0	890	890
	75	101.8	1120	1120
	100	123.0	1300	1300
Model 8	50	116.3	1535	1535
	75	139.0	1810	1810
	100	164.0	2315	2315
Model 10	50	141.0	1810	1810
	75	173.3	2280	2280
	100	197.2	2525	2525
Model 12	50	176.0	2485	2485
	75	214.0	3000	3050
	100	247.0	3320	3320

WATER-SPRAY SYSTEMS for Flammable Liquids

Permanently piped systems of open or automatic water-spray nozzles are intended for protection against fires in oil-filled electrical equipment such as transformers and oil switches, in oil piping, open flammable liquid storage, and processing equipment.

Only complete systems installed under the direction of the manufacturer or an accredited representative will obtain Factory Mutual approval.

When open nozzles are used, the automatic control equipment of water spray systems should be equivalent to that required for approved special sprinkler systems, with automatic opening valves supervised as specified for deluge or pre-action systems.

The effectiveness of water-spray protection o[n] on many factors such as nozzle spacing, elevation, direction or angle of discharge, water pressure, velocity, and the flash point, viscosity, and temperature of the flammable liquid to be protected.

Detailed information on proposed installations should be submitted to the Factory Mutual Engineering Division for acceptance. The information submitted should give complete data in regard to the location of curbs or overflow drains, type, size, location and number of nozzles, piping layout, strainers, flushing valves, water pressure available at full flow, and control equipment.

"Automatic" Sprinkler Corp of America Youngstown O

Fire-Fog Systems. Open. Strainers and nozzles manufactured by Spray Engineering Co., Burlington, Mass.

Blaw-Knox Co Automatic Sprinkler Dept 820 Beaver Av Pittsburgh 33 Pa

Water-Spray System. Open and automatic.

Central Automatic Sprinkler Co Inc Fourth St & Cannon Lansdale Pa

Nozzles. Type FM-C. Open and automatic.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route 7 Box 750 Newark 1 N J

Globe Nozzles. Type A. 2-0 (5/16 in.), 3-0 (3/8 in.), 4-0 (7/16 in.). Open.

Globe Nozzles. Type D. 5D16, 3D8, 7D16. Open and automatic.

Grinnell Corp Providence 1 R I

Multifyre Systems.

Protectospray Systems. Types D3 open, E4-I open and automatic.

Hodgman Mfg Co Taunton Mass

Nozzles. Type A. ¼, ¾, 5/16 in. Open and automatic.

Reliable Automatic Sprinkler Co Inc 323 N MacQuesten Pkwy Mt Vernon N Y

Nozzles. Type C. ½, ¾ in. (180°). Open and automatic.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass

Waterfog Systems.

Nozzles. Series T. Open and automatic.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa

Star Water-spray System.

Nozzles. Types A5-FM, C8-FM, C8-FM. Open and automatic.

Nozzles. Models A3-W4, A3-S4, A2-W5, A2-S5, A1-W6, A1-S6. Open.

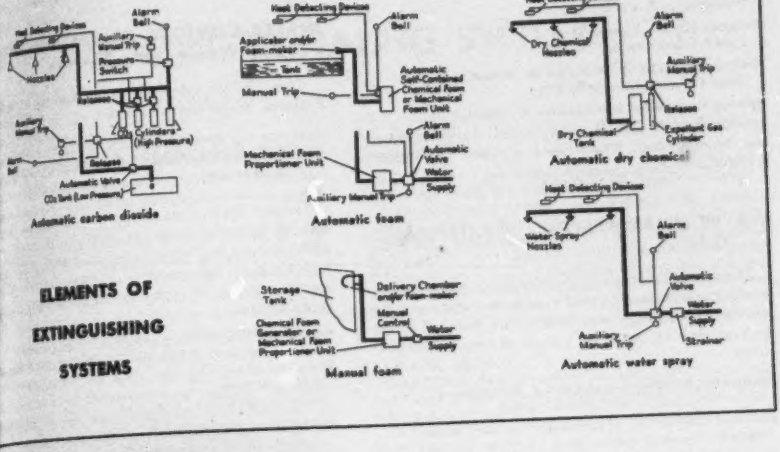
Viking Corp Hastings Mich

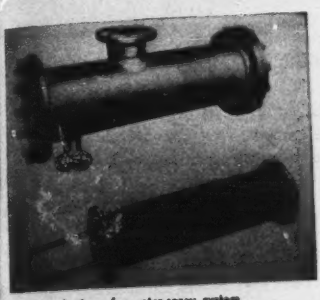
Nozzles. Models AB, AC, AD. Open.

Nozzles. Model F. Open and automatic.

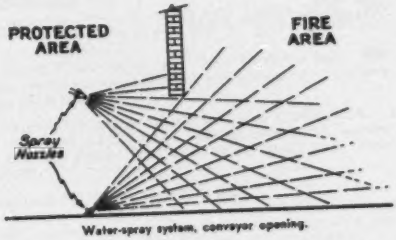
WATER-SPRAY SYSTEMS, for Transformers

Oil cooled transformers can be protected with water spray discharged from a few large capacity nozzles operated at moderate pressure. Nozzles suitable for this service have discharge angles in the 60°-100° range and discharge rates of 75 to 105 gpm at operating pressure of 25 psi.





Strainers for water-spray system.



Water-spray system, conveyor opening.

Before an installation is started plans should be submitted to the Factory Mutual Engineering Division for review.

[illegible]matic" Sprinkler Corp of America Youngstown O
[illegible]yron Fire-fog Nozzle. No. 6611B. 68°. 103 gpm at 25 psi.

[illegible]te Fog Nozzle Inc 309 Wells St Greenfield Mass
[illegible]ate Nozzle. Model T-1. 80°. 85 gpm at 25 psi.
[illegible]ate Te-Cone Nozzle. Model N-0. 70°. 100 gpm at 25 psi.

[illegible]ndell Corp Providence 1 R I
[illegible]Proportspray Nozzle. Type D-3 No. 48. 78°, 85°, 92°. 82 gpm at 25 psi.
[illegible]Proportspray Nozzle. Type D-3 No. 50. 78°, 85°, 92°. 89 gpm at 25 psi.

Rockwood Sprinkler Co Worcester Mass
Waterfog Nozzle. Type H25-210. 75°. 100 gpm at 25 psi.

Spraying Systems Co 3201 Randolph St Bellwood Ill
Fulljet Nozzle. Type 2H60. 80°. 90 gpm at 25 psi.

WATER-SPRAY SYSTEMS, for Conveyor Openings

These nozzle systems produce a water spray discharge to exert a counter draft effect on an opening to prevent passage of fire and gases. Installations should conform to Factory Mutual recommended standards.

"Automatic" Sprinkler Corp of America Youngstown O
Spraco Nozzle Systems.

Grinnell Corp Providence 1 R I
Protectospray Nozzle Systems.

Hodgman Mfg Co Taunton Mass
Type A Nozzle Systems.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Model T Waterfog Nozzle Systems.

Spraying Systems Co 3201 Randolph St Bellwood Ill
Fulljet Nozzles. Nos. 1H7, 1¼H10, 1½H16, 1½H20, 2H35.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Model A or Type A Nozzle Systems.

WATER-SPRAY SYSTEMS, for Horizontal Driers

These nozzle systems are suitable where it is necessary to discharge water spray in a wide flat spray pattern and with good range to protect narrow enclosed spaces such as may be found in horizontal-type, continuous driers.

"Automatic" Sprinkler Corp of America Youngstown O
Spraco Model .250F, .375F Nozzle Systems.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Type D-1 Nozzle Systems.

Star Sprinkler Corp Westmoreland & Collins Sts Philadelphia 34 Pa
Fan-spray No. 4 Nozzle Systems.

Viking Corp Hastings Mich
Viking Window Sprinklers. ¾-, 5/16-, ¾-in.

WATER-CONTROL VALVES, Automatic, for Water-spray Systems

These valves are listed under Automatic Sprinkler Systems, Water-control valves.

WATER STRAINERS, for Water-spray Systems

Factory Mutual standards recommend the installation of approved main-line strainers in permanently piped water-spray systems under certain conditions where water supply and nozzle size where foreign matter entering the piping might cause plugging of the water spray nozzles.

"Automatic" Sprinkler Corp of America Youngstown O
Fire-fog Strainers. Models 818 (2 in.), 819 (2½ in.), 820 (3 in.), 821 (4 in.), 834 (6 in.) size. (Mfd by Spray Engineering Burlington Mass)
Strainer. Model 154. 6 in., 8 in.

Grinnell Corp Providence 1 R I
Strainer. Model A. 3, 4, 6, 8 in.
Strainer. Model B-1. Fig. 1262. 3, 4, 6, 8 in.

Rockwood Sprinkler Co 38 Harlow St Worcester Mass
Strainwell. Model C. 2½ in.
Strainwell. Model E11. 4 in.

ELECTRIC SIGNALING SYSTEMS

Electrical protective signaling systems are available to detect and give the alarm for fire or smoke, to supervise the condition of automatic sprinkler systems and water supplies, to give water-flow alarms, and to supervise the watchman's service.

The systems are classified in four main groups: local station, proprietary, local, and auxiliary. A central-station system is independently owned and gives signals at a constantly attended station not on the protected premises. A proprietary system is similar but is owned or leased by the protected property. A local system is owned and operated by the protected property but does not have an operator in constant attendance at a central-supervising station. An auxiliary system is one that automatically transmits an alarm over the municipal fire-alarm system. Local or proprietary systems are often auxiliarized by wiring to a city-connected master fire-alarm box.

FIRE-ALARM SYSTEMS, Automatic, Heat-actuated

Heat-actuated fire-alarm systems employ detecting devices either of the "spot" or "line" type that operate either at fixed temperatures or on a sudden increase in temperature, known as the rate-of-rise principle. Some incorporate both fixed temperature and rate-of-rise operation.

Most automatic systems can also be arranged for manual operation.

American District Telegraph Co 155 Sixth Av New York 13 N Y

Aero System. Employs heat-detecting equipment operating primarily on the rate-of-rise principle. Auxiliary components may be used to permit fixed-temperature operations. Although one system would not necessarily utilize all components, the following are applicable: Aero detector transmitter C4202-A, -G, -M, Aero detector 774-M, -C, -MC, -T, -MT, -F, -MF, Aero tubing 790-M, -F, -MF, Aero rosette B1403, retard transmitters C1101-10, -24, -60, -110, fixed-temperature attachments 4113 (136°, 203°F) and 4117 (same ratings as Grinnell Quartzoid sprinklers), Aero annunciators D780 (4 targets), -F (8 targets), -R (12 targets), -RF (16 targets), power set 2616, vibrating bells B572, B572-W, B575-C4, B170-C-6.

Telechron System. 4205. Operates on temperature rate-of-rise principle and uses compensated thermocouple junctions as heat-detecting elements. Approved for central-station connections when engineered, installed and maintained by ADT only. The following equipment is applicable (keys, test kits, etc., not included): Control B4205-C, -M, -F, -MF, control 4204-M, -F, detectors 4205-1, -2, -3 -4, -6, -8, -12, -72, retard transmitter panel D1101 (with 606 control), blower compensator B4205 (for special case applications only). Annunciator, power supply, local bells, etc., same as Aero.

Atmo Automatic Fire Alarm Systems Kidde Ultrasonic & Detection Alarms Inc Brighton Rd Clifton N J

Noncode Systems. Consist of control panels J-374, J-374-SA, J-374-SC, J-206, CR-12, CR-12 (presignal), CR-24, CR-24 (presignal), zoning panels J-374,Z, A-1, annunciator panels A-(2 digits)-S, A-(2 digits)-X, rectifier panels J-516, (models R-56-A, -B, or -C), Atmo break-glass stations B-1, B-3, B-8, Atmo pneumatic tubing and detector unit RD-1, auxiliary relay J-375, lamp annunciator panel J-379, approved Atmo bells 2, 4, A, C, P, T, P, A, or D, Fyrindex heat detectors, approved waterflow circuit closers.

Autocall Co Shelby O

Type DNS System. Consists of control panel DNS with time-limit cutout removed, vibrating bells RV or RVF, approved electric horns and circuit closers.

Control Panel. Type DNS-5 (S, DS, SL, or DSL) used with above bells and detectors. Panel can be arranged to trip automatically a separately purchased master fire-alarm box which is city connected.

Noncoding Panels. Types LSPN-1E, LSPN-4 (to 48 circuits max). With vibrating bells RV or RVF, approved electric horns and circuit closers.

Coding Panels. Types LSPC-4 (to 24 circuits max). With single stroke and vibrating bells R or RV, approved electric horns and circuit closers.

Dictograph Products Inc Shelter Rock Lane Danbury Conn

Supervisory Control Panels. Models 55-O, 55-LE. Locator. Annunciator Panel. Model 55-O. Power Supply Unit. Model 55BPS.

Gamewell Co Newton Upper Falls Mass

Shunt-type Auxiliary Fire-alarm Systems. Consist of a municipally connected Gamewell shunt-type master fire-alarm box, master-box-reset supervisory panel, approved circuit openers.

Localarm System. Consists of supervisory control panels 91500-A, 91501-A, 91502-A or 91503-A designed to provide coding or noncoding alarm signals and to operate local-energy-type master fire-alarm box (optional), emergency standby battery unit 91504.

Flexalarm Type A Systems. Consist of supervisory control panels 1, 1A, 1AA, 1AA3, 1AA6, 1CB, 1CG, 1D, 1EA, 1EM, 1LV, 2, 2AA, 2AAA, 3, 3A, 3A-FM, 4, 5, 5A, 12 with attached single-stroke and/or vibrating alarm bells and approved circuit closers to provide for coding or noncoding alarm signaling. Systems and panel components designed to operate from 115v 60c service.

Flexalarm Type B Systems. Consist of supervisory control panels 1B, 1SFM, 2B, 6B, 8B, 9B, 9B1-S, 10B with attached vibrating alarm bells, approved circuit closers and zone-annunciation panels. Systems are designed to operate by 21.5v d-c supplied from 115v transformer-rectifier panel and/or standby battery units

Notifier Corp 3760 N 56th St Lincoln 4 Neb

System consists of the following, used in combination as applicable: power supply RPS-2W, control panels AN, FS, NU, PN, tripping device AFS-01, heat-actuated fire-detectors 501, 502, 503, 504.

Protectowire Co Hanover Mass

Type XDC-CS System. Consists of one or more circuits of Protectowire and supervisory-control panel with power supply and alarm signals. Protectowire is a line-type, fixed-temperature, heat-sensitive cable, consisting of two steel wires with thermoplastic coating twisted together with a protective braided covering. When exposed to heat of fire the thermoplastic coating softens and permits the two conductors to make contact with each other. The wire may be obtained with nominal 155°, 185°, 270°F ratings. The alarm system may be either an open circuit or a closed circuit with supervisory circuit. Control panels CSDC-1, -2, -3, -4, -5, -6, power-supply unit SBPS.

Spurling Fire Alarm & Indicator Co Inc 100 High St Athens Tenn

Noncode Automatic Fire-alarm System. With facilities for direct connection to municipal alarm headquarters. This system consists of the Spurling Indicator (at protected property), Fire Watchman automatic heat detector, Locator (optional at public fire station).

FIRE-ALARM SYSTEMS, Automatic, Smoke-actuated

Smoke-actuated fire-alarm systems are usually local systems, but some can be arranged for central-station alarm with additional equipment. Those presently approved operate on either a photoelectric principle or one which involves radioactive ionization of a smoke-detecting chamber.

The photoelectric principle is based on the change in photoelectric current which accompanies a change in light intensity on a photoelectric cell or a combination of cells. In either case, the current change results in relay operation which causes a distinctive smoke-alarm signal at the supervisory station.

In the beam type of system, the light source and photoelectric cell are located in the protected area. In the air-sampling type, a continuous sample of air is drawn by a blower from the protected area into a smoke chamber containing the light source and photoelectric cells. Installation, supervision, and maintenance by the manufacturer is a condition of acceptance.

The radioactive type of system consists of individual smoke-detecting heads which are normally ceiling mounted and electrically connected to control and indicating panels. Each detector contains radioactive material which ionizes the air in special chambers within the detector. Smoke particles entering the exposed chamber upset the normal ionization and result in an alarm condition.

American District Telegraph Co 155 Sixth Av New York 13 N Y

Smoke-detection System. B3501. Beam type. Consists of light source 3501-LP or B3501-L, receiver C3501-R or C3501-R-5, power set B2606, control panel C3501-C, filament supervisory unit B3501-F, battery 2618. Other equipment such as transmitter, annunciator, bells, etc., as required.

Fyr-Fyter Co 221 Crane St Dayton 1 O

Industrial Smoke Detectors. Air-sampling types I-4, ID-1, IS-1, IS-1M. Require a battery-operated power-failure indicator to supervise the power source. I-4 uses indicator PF-2. ID-1, IS-1, IS-1M use indicator T-1. IS-1, IS-1M are [illegible] for actuating automatic fire-extinguishing systems. IS-1[illegible] cludes an auxiliary and has a heavier (30/10 amp at 1[illegible] load relay than IS-1.

Walter Kidde & Co Inc 675 Main St Belleville 9 J

Area Sampling Systems. Types L, ML, C, MC. L is for service with single sampling line. ML is for local service with or 12 sampling lines. L and ML require use of Kidde failure indicator to provide power supervision. C and MC normally used as part of a central-station system, C for sampling line, MC for 4, 6, or 12 sampling lines.

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn

Smoke-detection System. Consists of sensor light-beam [illegible] W702A, annunciator and control panel W703A, projector W704A. One annunciator may accommodate 5 zone circuits, of which may have several projector-sensor sets. Zone wiring is limited to 500 ohms. Projector and sensor units spaced between 15 and 160 ft apart. Common primary supply 120v, 50 or 60c.

Pyrotronics Div of Baker Industries Inc Box 290 South Newark 12 N J

Pyr-A-Larm System. Type C-B. Consists of fire-indicating cabinet C-B, space-indicating cabinet C-B (optional, 4 max), emergency power supply 458, and pre-detector heads. Types S-522-C or S-522-F may be used to provide heat actuation. FES5. This is basically a smoke detector and is generally sensitive to some clean-burning combustibles such as illuminating gases, alcohol and acetone. However, the system does respond to other products of combustion that are also invisible, as from a tallow-candle flame or freely burning paper.

FIRE-ALARM SYSTEMS, Automatic, Flame radiation-frequency-actuated

The following fire-alarm system is of the radiation frequency-discrimination type. Operation depends on the flicker associated with vapor-phase combustion. The system is not heat-actuated.

Fireye Div Electronics Corp of America 77 Broadway Cambridge 42 Mass

Automatic Fire-alarm System. Control Type 70AA1, Model 1002. Supplementary Control Type 74DD4, Model 1003. Detectors Type 41RT1, Models 1004, 1005, 1006. The supplementary control is a booster which increases the maximum number of detectors per system from 3 to 20.

FIRE-ALARM SYSTEMS, Manual

The following nonautomatic systems are equipped with manually operated fire-alarm boxes.

Acme Fire Alarm Co Inc 106 Seventh Av New York 11 N Y

Local Fire Alarm System. Type A. Consists of control panel, manually operated coding stations 1200, 1200B, 1201, gong, trouble bell TB.

Local Noncode Fire-alarm System. Type VVA. Consists control panel VVA, break-glass stations 1290 BOS, 1291 BOF, 1292 BOS, 1293 BOF, vibrating bells VA.

Coded fire-alarm system. Types CA, CM. Consists of control panel, CA, CM, manual stations 1271, alarm gongs FC, associated signal recorder (register).

...n District Telegraph Co 155 Sixth Av New York 13 N Y
...s system. Consists of control panel 539-A1, -A2, -AP1, ...stations 1044, alarm bells 3206, trouble bell B575-C-110. ...l system. Consists of control panel 536A/D-1, -2, -3, -4, ...1046, alarm bells 134-A/D, SP-6, -8, -10, trouble bell ...C-118. Recorder, horns, etc., optional.
...l system. Consists of control panel 536 A/DJ-2, -3, ...esignal stations 1046, presignal bells 134.

...l Co Shelby O
...ds System. Consists of control panels DNS, DNS-5 ...L, -DS, or -DSL), LSPN-1E, LSPN-4 (to 48 circuits max), ...e NC or FNC, bells RV (RVF), and/or approved electric

...ing System. Consists of control panels D, DG, D-OB, DP, ...bells R, RV, RF, RVF, RWG, RVWG, chimes HX, XY, ...l electric horns, stations F, FF, LA, LP, MA, NY, NYP ...ed is indicated by P).
...l panel 5A, stations NC or FNC, bells R, RV, RF, RVF, ...RWG, approved electric horns.
...ls D, DG, DF, DPH connected to an auxiliarised municipal ...box by selective relays RE-1 or RE-2.

...h Co Inc Norwalk Conn
...l System. Consists of control panel 1226, stations 1250, ...1252 or 1253, approved Edwards bells. Annunciator 808 ...l.

...KLER-SUPERVISORY SYSTEMS

...kler-supervisory and waterflow-alarm systems ...of signal-initiating devices to supervise all ...ant parts of a sprinkler system, or as much as ...l, and to provide distinctive signals at a central ...ving station or other point, from which com- ...t assistance will be assured.

...ey are arranged to detect such features as (1) the ...n or closed position of control valves, (2) the flow of ...r in sprinkler systems, indicating fire or leakage, ...water levels and temperatures in gravity and pres- ...e tanks, (4) air pressure in dry-pipe systems and ...ure tanks, (5) fire pump steam pressure, and ...oltage of the supply for electric fire pumps.

The signaling apparatus in general consists of special ...ices attached to the various devices being super- ...l. The switches are connected through closed cir- ...s to transmitters which send code signals to the ...ral station. Some manufacturers provide a trans- ...er directly on each device being supervised. All ...ch boxes are provided with tamper switches which ...mit a signal to the central office if the cover is ...ved.

...n Fire Alarm Co Inc 106-110 Seventh Av New York 11 N Y
...Sounds System. Type 1208. Consists of control-panel- ...ransmitter 1206, bells V 8 and T 8 and approved circuit closers.
...Sounds System. Types 234-SP, 234-TA. Consist of control- ...transmitter 234, bells V 8 and T 8 and approved circuit ...s.

...rican District Telegraph Co 155 Sixth Av New York 13 N Y
...transmitter 1082, 1083, or 1085, power set B2616, battery 2618 ...91), alarm bells 3204, trouble bell 22P5, approved circuit openers. (Alarm-retard capacitors and associated cabinet available if required.)

Autocall Co Shelby O

Type DNS. Consists of control panel DNS (time-limit cut-out removed), bells RV or RVF, and approved normally open actuating devices.

Noncode System. Consists of control panel LSPN-1E or LSPN-4 (to 48 circuits), bells RV, RVF, or RVWG, approved electric horns, and normally open supervisory devices.

Coding System. Consists of control panels LSPC-4 (to 24 circuits), bells R, RV, RF, RVF, RWG, or RWVG, approved electric horns, normally open supervisory devices.

Central Station Alarm Co 610 N Akard St Dallas 1 Tex

Waterflow Supervisory System. Model CA-10. Consists of subscriber's unit and fire-station unit (control panels) and approved waterflow indicators and bells. Approved for supervising 24 more than two risers where close cooperation between the protected property and a constantly attended public fire station is assured.

Notifier Corp 3700 N 56th St Lincoln 4 Neb

Control Panels AN, FS, PN, NU. Power Supply RPS-3W. Relay Units AR. Tripping Device AFS-01 (used with PN series). Used in combination, as applicable, and with approved circuit closers of other manufacture.

Spurling Fire Alarm & Indicator Co Inc 100 High St Athens Tenn

Spurling Indicator and Spurling Locator (optional) when used with suitable approved circuit closers of other manufacture.

WATCHMAN-SUPERVISORY SYSTEMS

Watchman-supervisory systems are for the transmission and recording of signals manually initiated at watchman's key stations distributed about the premises. The central station and proprietary systems frequently combine watchman's supervisory with fire-alarm systems, though they may be entirely separate. For local systems, in addition to those listed in this section, see also section on Watchman's Clocks.

American District Telegraph Co 155 Sixth Av New York 13 N Y

Watchman's Supervisory System. There are two types. One is the combined system in which each station is a combination watchman's and fire-alarm box. The other is the compulsory tour watchman's system. The signals at the beginning and end of each watchman's system. The signals at the beginning and end of each are transmitted to a central station. All intermediate stations must be visited in proper order; otherwise, the key which the watchman uses at all stations cannot be inserted in the signal transmitter at the last station.

Morse Signal Devices 6707 Carnegie Av Cleveland 3 O

Watchman's Compulsory Tour System. No. 8058. Basic system consists of tour key 8058K, start-finish signal transmitter 8058S, and 3 to 10 stations 8058D. Systems may be expanded to 81 stations maximum by using immediate signal transmitter 8058I. Optional emergency-signal transmitter 8058E is available. Transmitters are central-station connected.

CENTRAL-STATION SYSTEMS

A central-station system consists of electrically operated circuits, instruments and devices, together with necessary electrical energy supply, designed to transmit alarms and supervisory and trouble signals to a constantly attended central station where signals are

recorded, and experienced operators will take proper action in accordance with prescribed regulations. Such systems are independently owned, controlled, and operated by a person, firm or corporation, whose principal business is the furnishing and maintenance of supervised protective signaling service, and who has no other interest in the protected properties. These systems are adaptable to plants of any size and may consist of a simply manually operated fire alarm system, an extensive system including manual fire alarm boxes and automatic fire and smoke detecting devices with coded signals, and supervision of the sprinkler system, waterflow alarms and watchman's tours.

There are two types of systems. The Class A system permits manual or automatic adjustments at the central supervisory station so that alarms may be received despite a line fault such as a single break or ground. Trouble signals indicate the fault condition. The purpose is not to eliminate the necessity of line-fault corrections, but merely to maintain system operation until repairs can be made. In the Class B system, a single break or ground which prevents proper operation is automatically indicated at headquarters by a trouble signal so that the condition may be promptly remedied. Both types are approved as indicated in the listings, but the Class A system is considered somewhat less subject to interruption.

Alarm Signal Co of Texas 203 E Eagle St Pasadena Tex
Central Station Service. For waterflow, sprinkler-system supervision, watchman supervision, and fire alarm.

Albany Protective Service 99 Jay St Albany N Y
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

American District Telegraph Co 155 Sixth Av New York 13 N Y
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm, including smoke detection.
Supervisory Control Unit. Type B4604-C and 24v battery unit. For waterflow, sprinkler-system supervision, and fire alarm.

American Fire Dispatch Inc 6317 S Figueroa St Los Angeles 3 Cal
Central-Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Automatic Alarm Corp 210 S 5th St (McKnight Bldg) Minneapolis 5 Minn
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Automatic Fire Alarm Co Consolidated Fire Alarm Co Div Bourse Bldg Philadelphia Pa
Central Station Service. For fire alarm.

Automatic Fire Alarm Co 120 W 42nd St New York N Y
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Call's Police Signal Corp 65-69 Washington Av Chelsea 50 Mass
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Central Alarm Co 916 W Adams St Phoenix Ariz
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Central Office Alarm Co Inc 37-08 Orchard St Long Island City N Y
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Central Station Signals Inc 53 W 23rd St New York 10 N Y
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Central Watch Service 214 W Ohio St Chicago 10 Ill
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Dayton Electronics Alarm & Signal Inc 130 W Second St Dayton 2 O
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Denver Fire Reporter & Protective Co Inc 421 Tremont Pl Denver 5 Colo
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Electro-Protective Corp 12 W 22nd St Baltimore 18 Md
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Electro-Protective Corp 60 Lafayette St Newark 2 N J
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Federal Engineering Co Inc 1004 Sixth St N W Washington D C
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Granite State Alarm Co Inc 720 Union St Manchester N H
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Kedzie Kane Alarm Co 301 N Kedzie Av Chicago Ill
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

McCane-Sondock Detective Agency 1617 Austin St Houston
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Merchants Police Signal & Alarm Co 429 W Michigan St Milwaukee 3 Wis
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Michigan Still Alarm Co 10410 W Chicago St Detroit 4 Mich
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Morse Signal Devices 6707 Carnegie Av Cleveland 3 O
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Morse Signal Devices of California 211 S LaBrea Av Los Angeles 36 Cal
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Newark District Telegraph Co 372 Plane St Newark 2 N J
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Owl Protective Co Inc. 120 N Camac St Philadelphia 7 Pa
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

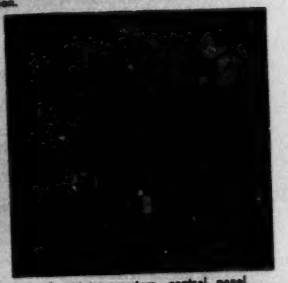
Central-station headquarters.

Combination fire-alarm and watchman's station.

Combination control and annunciator panel.

Fire-alarm system, smoke actuated.

Central-station system, transmitter.



Proprietary system, control panel.

Fire-alarm system, smoke actuated.
Light source (left), photoelectric cell (right).

Audible signal, megaphone horn.

Audible signal, grill horn.

Fire-detection devices.

Audible signal, yard bell with weatherproof hood.

Pacific Fire Extinguisher Co American Burglar Alarm Div 165 Jessie St San Francisco Cal
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Potter Electric Signal Co 1211 Pine St St Louis Mo
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Protection Alarms Inc 725 W Main St Peoria Ill
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Protection Engineering Corp 6000 S Hoover St Los Angeles 44 Cal
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Rhode Island Electric Protective Co 111 Mathewson St Providence R I
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Robinson Electronic Supervisory Co Robinson Bldg 15th & Chestnut Sts Philadelphia 2 Pa
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Sentinel Alarm Corp 10th and Vine Sts Philadelphia 7 Pa
Central Station Service. For waterflow, sprinkler-system supervision, and fire alarm.

Smith Detective Agency & Nightwatch Service Inc 610 N Akard St Dallas Tex
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

Walnut Hill District Telegraph Co 108 W Sixth St Cincinnati O
Central Station Service. For waterflow, sprinkler-system supervision, watchman's service, and fire alarm.

PROPRIETARY SYSTEMS

A proprietary system is similar to a central-station system but is owned or leased by the owner of the protected property and entirely under his control. They are usually complex systems custom-made for the application.

Applications requiring proprietary type signaling systems usually involve the supervision of several phases of plant fire protection, including sprinkler and water flow, watchman's service and fire alarm. Because the headquarters of a proprietary system must be constantly attended, the common procedure is to receive and record all signals at a central console (or desk) designed specifically for the particular application. Consequently, a complete proprietary system normally consists of relatively simple actuating devices wired to a complex, custom-made control console or panel(s).

At present, it is not considered practical to approve and list proprietary systems by model designation or combination of individual components designation because seldom are two systems alike. However, proprietary system applications are subject to acceptance by the Factory Mutual Engineering Division; consequently, the functional details of a proposed system should be submitted to the nearest District Office for review prior to installation.

Although no attempt is made to list all possible suppliers of satisfactory proprietary signaling systems, experience shows that the following manufacturers are willing to and capable of supplying such systems; each proposed system is subject to individual consideration before acceptance.

Acme Fire Alarm Co Inc 106 Seventh Av New York 11 N Y

American District Telegraph Co 155 Sixth Av New York 13

Autocall Co Shelby O

Central Station Signals Inc 53 W 23rd St New York N Y

Derby Devices Inc 118 Quinnipiac Av North Haven Conn

Gamewell Co Newton Upper Falls Mass

Potter Electric Signal Co 1211 Pine St St Louis 3 Mo

Protectowire Co Hanover Mass

Westinghouse Electric Corp 2519 Wilkens Av Baltimore 3 Md
Teletronics Industrial Security System

REMOTE-STATION SYSTEMS

An approved remote station signaling system usually consists of a supervised local system connected by leased telephone circuit (supervised) to a constantly attended public fire station. For this reason, it is essential that there be complete cooperation between the protected property and the remote station personnel. Otherwise, a substandard system may result in application regardless of equipment performance.

Listed central-station services also can supply this type of signaling system.

Autocall Co Shelby O
Remote Station System. Consists of supervisory panel L8PN-1D, transformer/rectifier TRP, remote-signaling unit FDA-1, battery supply CRSP, and associated normally open and/or closed system-actuating devices.

Central Station Alarm Co 610 N Akard St Dallas 1 Tex
Remote Station System. Consists of subscriber's unit CA-1, fire-station unit CA-10, and associated normally open system-actuating devices.

Gamewell Co Newton Upper Falls Mass
Flexalarm Remote Station System. Consists of supervisory control panels 6B1 and 6B1-43, remote-station panels 7B and 7B-1, with battery-charger panel 9B1.

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn
Remote Station System. Consists of supervisory-control panels W258A1005, W259A1003, W261A1009, and power-supply units W256A1025, W257A1007.

These systems include associated approved normally open fire-detecting or waterflow devices and approved normally closed system-actuating devices for sprinkler supervision such as valve position switches. Panels and actuating devices are normally connected by a leased telephone circuit having maximum length of 15 miles.

Notifier Corp 3700 N 56th St Lincoln 4 Neb
Remote Station System. Consists of control panel PN, pro-

ly RFS-2W, tripping device AFS-01, fire-station receiving
PS, and associated normally open system-actuating devices.

ic Fire Extinguisher Co 142 Ninth St San Francisco 3 Cal
te Station System. Consists of supervisory control panel
4, alarm control panel RSF-2 and rectifiers PFE 41.

r Electric Signal Co 1211 Pine St St Louis 3 Mo
te Station System. Model RRS-1. Consists of panels
, MRP, MRP-S, MPA and/or MPA-S and power supply

ing Fire Alarm & Indicator Co Inc 100 High St Athens Tenn
te Station System. Consists of Spurling indicator (at
rol property), locator (at public fire station) and associated
ly open system-actuating devices.

SIGNALING EQUIPMENT

Following are listings of approved individual components used in the various types of signaling systems. Also the listing for Watchman's Clocks.

e Fire Alarm Co Inc 106 Seventh Av New York 11 N Y
ntinental Fire Alarm and Watchman Station. Manual.
1171-CS. For central-station systems.

ation District Telegraph Co 155 Sixth Av New York 13 N Y
st-indicator-valve Position Supervisory Switch. Type No.

h- and Low-pressure Switch. Type Nos. B66, (waterf), B66-X (explosionproof). Intended to supervise the air in a dry-pipe sprinkler system or in a sprinkler system ressure tank.

ow-pressure Switch. Type Nos. B67 (waterproof), B67-X losionproof). For supervising supply pressures such as re-main pressure and wet-riser pressure in a booster-pump em.

dry-pipe and Alarm Switches. Type Nos. B68 (waterproof), 8X (explosionproof), 6125, 6125-LC, 6125-LO. For supervision of either a wet- or dry-pipe sprinkler system.

Waterflow Supervisory Switches. Type Nos. 7, 7A. Valveoper operated.

ressure-actuated Transmitters. Types 6120, 6120-A, 6120-GS, 6120-D. For supervising operation of either a wet- or dry-pipe prinkler systems.

Control Unit. Model E700. Normally used with approved ait-closing devices such as noncode fire-alarm boxes, heat ervices, or waterflow indicators, to form a supervised signaling stem. For waterflow supervision, terminals 23 and 24 must be ernally connected.

Gravity-tank Water-level Supervisory Switches. Type Nos. 550 r wooden tanks, 550G for steel tanks.

Supervisory Switches. Type Nos. B613, C613-X (explosionproof). Intended to supervise the open position of OS&Y valves 6 in. and larger.

Gate-valve Supervisory Switches. Type Nos. 614, 614-X (explosionproof), 6129 (for gate-valve boxes).

Gravity-tank Temperature Supervisory Switch. Model B-56.

Pressure-tank Float Switches. Type Nos. 6109, B6109. For supervising water level in sprinkler-system pressure-tank. Tank pressure not to exceed 125 psi.

Air-pressure Supervisory Switch. Type No. 6119. For supervising dry-pipe sprinkler pressure wherein pressure is normally maintained in the 12–16 psi range.

Air-pressure Supervisory Switch. Type No. 6126. For supervising dry-pipe sprinkler air-pressure wherein pressure is normally maintained in the 20–90 psi range.

Low-pressure Switch. Type C668-X (explosionproof). For supervising air pressure of a rate-of-rise deluge or preaction sprinkler system. The switch is actuated in the event the supervised pressure decreases to 0.5 psi, although higher settings are possible.

Atmo Automatic Fire Alarm Systems Kidde Ultrasonic & Detection Alarms Inc Brighton Rd Clifton N J

All devices listed under Potter Electric Signal Co. are now approved for Atmo with the prefix K for each model or type designation, except the following:

Waterflow Transmitter. Model PH.

Electrically Actuated Alarm Transmitters. Models UAT-AC, UAT-TS, UAT-AC-TS.

Test Valve.

Autocall Co Shelby O

Temperature Switch. Model 57A. For supervising water temperature in a gravity tank. Operates at 160°F high limit and 40°F low limit.

Float Switches. Type Nos. 67A, 67B. For supervising water level in a gravity tank.

Pressure Switch. Type 63A. For supervising air or wat pressure and operates on high and low pressures. Working range is from 15 to 150 psi.

Valve Switch. Type No. 72. For supervising the open position of a rising-stem valve.

Pressure-actuated Switches. Types AV-2, AV-2X. For supervising operation of either a wet- or dry-pipe sprinkler system.

OS&Y Valve-signaling Units. Types VO2-F, VO6W-FW (waterproof). For supervising the normally open position of rising-stem valves, 2½ in. through 5 in.

OS&Y Valve-signaling Units. Type VO3-F VO7W-FW (waterproof). For supervising the normally open position of rising-stem valves, 4 in. through 12 in.

Coding Fire-alarm Stations. Types F, J, LA, LB, NY. Manually operated. Added designations: None, -S, -K, -P, -T, -L, -C. Styles 1 through 8.

Transmitter. MA(S)-ET(C), control panel ETS-1, -2, 18L, 28L. Normally used with approved actuating devices with normally open contacts.

Central Station Signals Inc 53 W 23rd St New York N Y

The following are approved for use in central-station signaling systems:

Gravity-tank Water-level Switch. Model AGS.

Gravity-tank Water-level Transmitter. Model AGT.

Clapper-actuated Waterflow Switch. Model AS.

Clapper-actuated Waterflow Transmitter. Model AT.

Pressure-supervisory Switch. Model BPS. For pressure tank or dry sprinkler system.

Pressure-supervisory Transmitter. Model BPT. For pressure tank or dry sprinkler system.

Pressure-actuated Switch. Model BS. To indicate sprinkler-system operation.

Pressure-actuated Waterflow-alarm Switch. Model BSR.

Pressure-actuated Transmitter. Model BT. To indicate sprinkler-system operation.

Pressure-actuated Waterflow-alarm Transmitter. Model BTR.

Pressure-tank Water-level Switch. Model CS.

Pressure-tank Water-level Transmitter. Model CT.

Valve-supervisory Transmitters. Models DT, DTA. Electrically released.

Valve-supervisory Switch. Model GS.

Valve-supervisory Transmitters. Models GT, IPT.

Post-indicator Supervisory Switch. Model PS.

Gravity-tank Temperature Switch. Model TS.

Gravity-tank Temperature Transmitter. Model TT.

S H Couch Co Inc North Quincy 71 Mass

Manual Fire Alarm Stations. Cat. Nos. F1-A, F1-AA, F1-AB.

Edwards Co Inc Norwalk Conn

Manual Coded Alarm Stations. Cat. Nos. 1250, 1251, 1252, 1253.

Electrically Supervised Manual Reset Annunciator. Model 808. For use with closed-circuit double-supervised fire-alarm system.

Fire Alarm Control and Supervising Panel. Model 1226. Component of manually operated coded closed-circuit fire-alarm system.

Fire Lite Alarms Inc 190 Fulton Ter New Haven 2 Conn

Tank Water-level Supervisory Switches. Types WLS-S (for steel tanks pressured to 150 psi max), WLS-W (for wooden gravity tanks).

High- and Low-temperature Switches. Models TTS-S, TTS-W. For use with approved alarm transmitter (such as Type PJ transmitter) to supervise the water temperature in gravity sprinkler-system supply tanks.

Waterflow-alarm Transmitter. Model WFTRA. For supervising wet systems in which water pressure may fluctuate. A retard device prevents false alarms due to fluctuations.

Waterflow-alarm Switch. Model WFSR. Similar to WFTRA, except two SPDT snap switches replace coding transmitter.

Waterflow-alarm Transmitter. Model WFTA. For supervising wet systems when connected to top of retard chamber of alarm check. For supervision of a dry-pipe system when connected to intermediate chamber of the dry-pipe valve.

Waterflow-alarm Switch. Model WFS. Similar to WFTA except two SPDT snap switches replace coding transmitter.

Waterflow-alarm Transmitter. Model WFTPD. Pressure actuated. For supervising operation of an excess-pressure wet system.

Waterflow Transmitter. Model PH. For supervising waterflow in a wet system which includes an alarm-check valve designed to accommodate the transmitter.

Electrically Actuated Alarm Transmitters. Models UAT, UAT-AC, UAT-TS, UAT-AC-TS.

Supervisory Code Type Transmitter. Models PJ, PJ-1-S. For supervising gate-valve operation, low air-pressure or abnormal-temperature applications and other equipment when used with approved signal-initiating devices.

Tank Water-level Supervisory Transmitters. Types WLT-S (for steel tanks pressured to 150 psi max), WLT-W (for wooden gravity tanks).

Air-pressure Supervising Transmitter. Model PF. For supervising air pressure in tanks or in a dry-pipe system. Transmits coded signals to indicate loss of air pressure or subsequent restoration of pressure to normal.

Test Valve. Model BV. For use by central-station company inspectors to test pressure-supervisory transmitters. Valve to be mounted between transmitter and supervised-air system.

Gate-valve Switches. Models OSYS, OSYS-B.

Gate-valve Transmitter. Model OSYT. For supervising open position of a gate valve.

Plug-type Gate-valve Switch. Model PTS. For supervising open position of nonrising-stem valves or valves located in wet areas.

Post-indicator Valve Switches. Models PIVS, PIVS-B, PIVS-C.

Post-indicator Valve Transmitter. Model PIVT. For supervising open position of a post-indicator valve.

High-low Switch. Model HLS. For supervising air pressure in a dry-pipe system or in a sprinkler-system air-pressure tank.

Gamewell Co Newton Upper Falls Mass

Manual Fire-alarm Stations. Coding type. Series 5. Cat. Nos. F500, F550.

Manual Fire-alarm Stations. Non-coding type. Cat. Nos. M46-1, M46-3, M46-5, M46-7, M46-9.

Minneapolis-Honeywell Regulator Co 2747 Fourth Av S Minneapolis 8, Minn.

Manual Fire Alarm Station. Type S436A.

Notifier Corp 3700 N 56th St Lincoln 4 Neb

Air-supervisory Switch. Class No. 9012. ACWS-HA. For supervising high air-pressure in dry-pipe sprinkler system.

Air-supervisory Switch. Class No. 9012. ACWS-LA. For supervising low air-pressure in dry-pipe sprinkler system.

Air-supervisory Switch. Class No. 9012. ACWS-WF. For supervising operation of either a wet- or dry-pipe sprinkler system.

Power Supply RPS-2W. Panel control series AN, FS, FT, relay units series AR.

Tripping Device. AFS-O1. Used with PN series.

Post-indicator Valve Switch. Cat. No. FSV-B. For supervising open position of a post-indicator valve.

Post-indicator Valve Switch. Model NIP. For supervising open position of a post-indicator valve.

Gate-valve Switch. Cat. No. OSY-1. For supervising open position of a gate valve.

Gate Valve. Model NGV. For supervising open position of a gate valve.

Plug-type Gate-valve Switch. Cat. No. PTG. For supervising open position of nonrising-stem valves or valves located in wet areas.

Manual Fire-alarm Stations. Model Nos. BG-1, BG-1-W.

Potter Electric Signal Co 1211 Pine St St Louis 3 Mo

Tank Water-level Supervisory Switches. Types WLS-I steel tanks pressured to 150 psi max), WLS-W (for wooden gravity tanks).

High- and Low-temperature Switches. Models TTS-S, TTS-W. For use with approved alarm transmitter (such as Type PJ) to supervise the water temperature in gravity sprinkler-system supply tanks.

Water-flow-alarm Transmitter. Model WFTRA. For supervising wet systems in which water pressure may fluctuate. A retard device prevents false alarms due to fluctuations.

Waterflow-alarm Switch. Model WFSR. Similar to WFTRA, except two SPDT snap switches replace coding transmitter.

Waterflow-alarm Transmitter. Model WFTA. For supervising wet systems when connected to top of retard chamber of alarm check. For supervision of a dry-pipe system when connected to intermediate chamber of the dry-pipe valve.

Waterflow-alarm Switch. Model WFS. Similar to WFTA except two SPDT snap switches replace coding transmitter.

Waterflow-alarm Transmitter. Model WFTPD. Pressure actuated. For supervising operation of an excess-pressure wet system.

Waterflow Transmitter. Model PH. For supervising waterflow in a wet system which includes an alarm-check valve designed to accommodate the transmitter.

Electrically Actuated Alarm Transmitters. Models UAT, UAT-AC, UAT-TS, UAT-AC-TS.

Supervisory Code-type Transmitter. Models PJ, PJ-1-S. For supervising gate-valve operation, low air-pressure or abnormal-temperature applications and other equipment when used with approved signal-initiating devices.

Tank Water-level Supervisory Transmitters. Types WLT-S (for steel tanks pressured to 150 psi max), WLT-W for wooden gravity tanks.

Air-pressure Supervising Transmitter. Model PF. For supervising air pressure in tanks or in a dry-pipe system. Transmits coded signals to indicate loss of air pressure or subsequent restoration of pressure to normal.

Test Valve. For use by central-station company inspectors

pressure-supervisory transmitters. Valve to be mounted
een transmitter and supervised-air system.
ate-valve Switches. Models OSYS, OSYS-B.
ate-valve Transmitter. Model OSYT. For supervising open
ition of a gate valve.
ge-type Gate-valve Switch. Model PTS. For supervising
position of sectrising-stem valves or valves located in wet

ve-indicator Valve Switches. Models PIVS, PIVS-B, PIVS-C.
dicator valve transmitter. Model PIVT. For supervising
position of a post-indicator valve.
ve-lever Switch. Model HLS. For supervising air pressure in
ipe system or in a sprinkler-system air-pressure tank.

otewire Co Hanover Mass
pervisory Panel. Cat. No. PCA. A signaling-system super-
ry panel which is a central-supervising station for an attended
e-signaling system and is used with separately purchased
ally operated fire-alarm boxes or automatic-coded alarm
es, arranged in one external series circuit consisting of two

ntrol Panel. Cat. No. PCA-1-CN. A signaling system super-
ry panel which is a separately enclosed and designated part
e PCA. It has particular application where the complete
A (including power supply, registers, bell and gongs, etc)
not be used because of insufficient space.
pervisory Transmitters. Cat. Nos. PST-224, -224 EP, 224A,
T. These are normally used with Protectowire heat-operated
tecting cable to form a part of an automatic fire-alarm
em which could be in the local or proprietary categories as
ined by the NFPA.
Control Panel. Cat. No. CAR. Combination control, annun-
tor, alarm panel for local system.
Manual Fire-alarm Stations. Cat. Nos. BG-50, BG-50W.

ire Electrical Co Inc 132 Lafayette St New York 13 N Y
The following are approved for use on proprietary- and central-
ion systems.
Valve-supervising Transmitter. Model ST.
ss-pressure-supervising Transmitter. Model FSST.
Waterflow Transmitter. Model FWT-D. For dry-pipe systems
wet-pipe systems through a retard chamber.
Valve-supervising Transmitter. Model VT-1.
Sprinkler-valve-supervising Switch. Models V, TV.
Waterflow-alarm Transmitter. Model FWT-W. With self-
ained recycling retard.
Pressure-actuated Waterflow-alarm Switch. Model FWS.
Automatic Fire-alarm Transmitter. Model FAT.
Supervisory-control Panel. Model No. FAT-2. Includes
ifier unit RE-502-2, battery unit 1.

UDIBLE SIGNALS

Bells for use on industrial fire alarm and signal
ystems and sprinkler alarm systems are generally avail-
ble in sizes 2½ in. to 12 in., for indoor or outdoor use
both the single stroke and vibrating types, for series
multiple operation at standard a-c voltages of 8 to
50 volts, and standard d-c voltages from 6 to 250 volts.
The vibrating contact type of bell cannot be used in
eries circuits as on supervised fire-alarm systems.
hen it is necessary to operate several vibrating bells
f the contact type on the same circuit, they must be
nnected in multiple.
A bell which combines both the single stroke and vibrating features is also available for use on d-c circuits only.

Single stroke bells are principally for use on the coded type of alarm systems.

Bells may be either the contact type or the no-contact type, known also as the contactless or synchronous type. The no-contact type can be used only on a-c systems, whereas some of the contact types may be used on either a-c or d-c, depending upon design.

Horns are designed for operation on 6, 12, 18, 24, 115, and 250-volt d-c circuits, and 8, 12, 24, 115 and 230-volt a-c circuits of 25 to 60 cycles, depending upon the circuit characteristics, which should be specified when ordering. Both the vibrating and motor-driven types are available for coding or general alarm signaling purposes, for indoor or outdoor use as desired, and are arranged for conduit wiring.

Vibrating a-c horns may be operated in series or in multiple circuits, but d-c horns of the same type must be operated in multiple only.

Atmo Automatic Fire Alarm Systems Kidde Ultrasonic & Detection Alarms Inc Brighton Rd Clifton N J
Atmo Bells. Models 2 (A,C,P), 4 (A,C,P) vibrating type. 3 (A,C,P), 5 (A,C,P) single-stroke type. Available for standard a-c or d-c voltages. 6, 8, 10 in.
Atmo Bells. Models (T or P) (A or D) vibrating neck type. Available for standard a-c or d-c voltages. 3, 4, 6, 8, 10 or 12 in.

Autocall Co Shelby O
Autocall Bells. Types R, RV, RF, RVF, RW, RVW, RWG, RVWG.
Autocall Electric Horns. Type Nos. 121, 122, 123, 124, 127, 128, 129 for a-c. Nos. 139, 144, 145, 146, 147, 148, 149 for d-c.
Autocall Chimes. Types XY, HX. 115v 60c.
Electric Horns. Models 55 (24 to 240v a-c), 56 (6 to 250v d-c).
Electric Horns. Model Nos. 350, 350-F, 351, 352. For 6 to 250v a-c.
Electric Horns. Model Nos. 450, 450F, 451, 452. For 6 to 250v d-c.

Edwards Co Inc Norwalk Conn
Vibrating Bell. Model 1001-T. 6 to 100v d-c.
Single-stroke Signal Bells. Model 24. 4, 6, 10 in. To 120v a-c, d-c.
Vibrating Bells. Model 560. 60c a-c.
Adaptable Vibrating Bells. Cat. No. 340. 4, 6, 10 in. 24, 115v a-c, 60c only. Other a-c voltages by special order.
Vibrating Bells. Cat. No. 325. For a-c series operation. 4 in. (3v), 6, 10 in. (6 v).
Vibrating Bells. Cat. No. 326. For a-c parallel operation. 4, 6, 10 in. Standard voltages to 250.
Electric Horns. Cat. Nos. 360, 362, 364 (12v a-c only), Nos. 370, 372, 374, 380, 382, 384 for a-c operation at 12, 24, 48, 115, 230, 250v. Available with Adaptahorn surface grille, flush grille, or single megaphone.

Electric Signal Co Div of Protectowire Co Hanover Mass
Vibrating Bells. Model UD. 4, 6, 8, 10 in. For 6, 9, 12, 24v a-c, d-c.

Federal Sign & Signal Corp 136th & Western Av Blue Island Ill
Bells, Gongs. Model Nos. 1-06 (6 in.), -08 (8 in.), -10 (10 in.), -12 (12 in.), 2-06 (6 in.), -08 (8 in.), -10 (10 in.), -12 (12 in.). Single stroke. 24, 110–120v a-c. 6–12v d-c. Model Nos. 3-06

(6 in.), -08 (8 in.), -10 (10 in.), -12 (12 in,). Vibrating. 24, 110–120v a-c. 6–12v d-c.

Electric Horns. Models 55 (24–250v a-c), 56 (6–250v d-c).

Electric Horns. Model Nos. 350, 350-F, 351, 352. For 6–250v a-c. Model Nos. 450, 450-F, 451, 452. For 6–250v d-c.

Electric Powered Sirens. Type A. For standard 6–110 voltages. 25–60c a-c or d-c.

Howe Electric Co 33 W Jackson Blvd Chicago 4 Ill

Vibrating Bells. Cat. Nos. A-12, A-115, WP-12, WP-115. A-c only.

Minneapolis-Honeywell Regulator Co 2747 Fourth Av S Minneapolis 8 Minn

Single-stroke Bells. Types SC80B, SC81B. Up to 12 in. Up to 220v a-c, d-c.

Vibrating Bells. Indoor service. Types SC90A, SC40A. Up to 12 in. Up to 220v a-c, d-c.

Vibrating Bells. Outdoor service. Types SC81A, SC41A. Up to 12 in. Up to 220v a-c, d-c.

Notifier Corp 3700 N 56th St Lincoln Nebr

Vibrating bells. Model C(M or F) (T or R)-6, -8, -10, -12 W and/or P. For 6 to 250v, a-c, d-c.

Vibrating bells. Model N(M or F) (T or R)-6, -8, -10, -12W. For 12 to 220v, a-c.

Vibrating bells. S(M or F) (T or R)-6, -8, -10, -12W. For 6 to 220v, a-c, d-c.

Reeve Electrical Co Inc 120 W 42nd St New York 36 N Y

Vibrating Bells. Types ATV (a-c, watertight), DTV (d-c, watertight), APV (a-c, waterproof), DPV (d-c, waterproof). Up to 220v. 3, 4, 6, 8, 10, 12 in.

Vibrating Bells. Type Nos. O, C, or P, -2-6 (a-c, 6 in.), -2-8 (a-c, 8 in.), -2-10 (a-c, 10 in.), -4-6 (d-c, 6 in.), -4-8 (d-c, 8 in.), -4-10 (d-c, 10 in.). Up to 220v.

Single-stroke Bells. Type Nos. O, C, or P, -3-6 (a-c, 6 in.), -3-8 (a-c, 8 in.), -3-10 (a-c, 10 in.), -5-6 (d-c, 6 in.), -5-8 (d-c, 8 in.), -5-10 (d-c, 10 in.). Up to 220v.

FIRE-DETECTION DEVICES

Proper location, spacing, and use of fire-detecting elements involve consideration of ceiling construction, location of partitions, normal room temperature, and heat from manufacturing processes or heating systems.

American District Telegraph Co 155 Sixth Av New York 13 N Y

Fire-detecting Thermostats. Nos. C666-W, C666-WF. Spot type, fixed temperature, heat-detecting device actuated by a bimetallic thermostatic disc. When heated to the operating temperature, the disc warps with a snap action to actuate the electrical contacts and thereby operates an alarm system or other apparatus. This thermostat is normally of the open-circuit, self-restoring type. Equipped with two 6-in. pigtail wires. C666-W is used for plain surface mounting. C666-WF is equipped with adapter plate for 4-in. octagonal knockout box mounting. Temperature ratings: 125°, 140°, 212°, 275°, or 350°F. 10 amp at 125v a-c or 0.75 amp at 125v d-c.

Fixed-temperature Thermostats. Type Nos. 4215 (140°, 160°, 225°, 275°, 325°F), 4215-X (140°, 160°, 225°, 275°, 325°, 450°, 600°, 725°F). Operating contacts normally open. Contact ratings: 5 amp at 125v a-c, 2 amp at 24v d-c, 1 amp at 48v d-c, 0.5 amp at 126v d-c.

Atmo Automatic Fire Alarm Systems Kidde Ultrasonic & Detection Alarms Inc Brighton Rd Clifton N J

Fyrindex Combination Rate-of-rise, Fixed-temperature Detectors. S-15-C (135°F), S-15-C1 (180°F). Operating contacts normally open. Contact ratings: 1.0 amp at 6-125v a-c or d-c, 0.3 amp at 125v d-c.

Fyrindex Rate-of-rise Detectors. S-16-R. Operating contacts normally open. Contact ratings: 1.0 amp at 6–125v a-c or d-c, 0.3 amp at 125v d-c.

Fyrindex Fixed-temperature Detectors. S-17-F (135°F), S-17-F1 (180°F). Operating contacts normally open. Contact ratings: 1.0 amp at 6–125v a-c or 6–24v d-c, 0.3 amp at 125v

Automatic Fire Alarm Co 120 W 42nd St New York 36 N Y

Watkins Spot-type Fixed-temperature Thermostat. Consists of two curved bimetallic strips set at a normal open position enclosed in a perforated-cover metal box. These strips are connected to terminal posts. Heat applied to the unit moves the operating end to make an electrical contact with a wiping action at the two silver-plated points. This device may be used to open an electrical circuit, sound an alarm, or trip a fire-extinguishing system. Thermostats are set to operate at final temperatures ranging from 140° to 360°F.

Derby Devices Inc 118 Quinnipiac Av North Haven Conn

Derby Fire Sentinel Spot-type Fixed-temperature Detector, Type BT. When heated to its operating point, a solder disc melts and the metal passes through small holes in an insulator to establish contact between two bronze discs internally connected to the terminals. For surface or flush mounting on a standard outlet box having attaching holes 2¼ in. on center. Available ratings: 135°, 212°, 286°.

Dictograph Products Inc Shelter Rock Lane Danbury Conn

Dictograph Combination Rate-of-rise, Fixed-temperature Automatic Detectors. Nos. R-F (135°F), R-F-1 (190°F). Operating contacts normally open. Contact ratings: 1.0 amp at 6–125v or 6–24v d-c, 0.3 amp at 125v d-c.

Edwards Co Inc Norwalk Conn

Edwards Fire Detector. Combination rate-of-rise, fixed-temperature detectors. Cat No. 241 (factory-set to operate at 136°F), 242 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Edwards Fire Detector. Fixed-temperature detectors. Cat Nos. 247 (factory-set to operate at 136°F), 248 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Fenwal Inc Ashland Mass

Detect-A-Fire Detection Devices. Types 27030-0, -1, -2, 27021-0, -1, -2, 27120-0, 27121-0. These devices, except as noted, are factory-prefixed with a standard operating temperature setting of 140, 160, 225, or 325°F. Self-restoring, designed to reduce materially the thermal lag of the units. Other operating temperature settings on request. Except as noted, devices have normally closed contacts have the following electrical ratings: 5 amp at 125v 60c, 0.5 amp at 125v d-c. Except as noted, devices having normally open contacts have the following electrical ratings: 5 amp at 125v 60c, 0.5 amp at 125v d-c, 1 amp at 48v d-c, 2 amp at 24v d-c.

Types 27020-0 (normally closed contacts), 27021-0 (normally open contacts). Horisontal flush mounting for concealed wiring.

Types 27020-1 (normally closed contacts, limited to 30v a-c or d-c when used with exposed wiring), 27021-1 (normally open contacts, limited to 5 amp at 30v a-c, 2 amp at 24v d-c when used with exposed wiring). Horisontal surface mounting for open wiring.

Types 27020-2 (normally closed contacts), 27021-2 (normally open contacts). Horisontal flush mounting for concealed wiring without orientation adaptor.

Types 27120-0 (normally closed contacts, available with adjustable settings at 450, 500°F), 27121-0 (normally open contacts, available

...abled ratings at 450, 600, 725°F). Vertical mounting in ...tion box. Considered suitable for use in occupancies desig... Class I, Groups C, D, Class II Groups E, F, G.

...Devices Inc 369 Lexington Av New York 17 N Y

...ct Fire Lowe...ator. Combination rate-of-rise, fixed-temper... detector. Models 501 (factory-set to operate at 136°F), ...190°F). Operating contacts normally open. Contact ratings: ...up at 6-125v a-c, 1.0 amp at 6—28v d-c, 0.3 amp at 125v d-c. ...up at 6-125v a-c, 1.0 amp at 6—28v d-c, 0.3 amp at 125v d-c. ...ct Fire Lowcator. Fixed-temperature detectors. Models ...(factory-set to operate at 136°F), 504 (190°F). Operating ...acts normally open. Contact ratings: 3 amp at 6–125v a-c, ...amp at 6-28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

...Devices Ltd 165 Spadina Av Toronto Ont

...Thermofix Fire Detectors. Combination rate-of-rise, fixed-...perature detectors. Models RF136 (factory-set to operate at ...F), RF190 (190°F). Operating contacts normally open. ...tact ratings: 3 amps at 6–125v d-c, 1.0 amp at 6–28v d-c, ...amp at 125v d-c, 0.1 amp at 250v d-c.

...Thermofix Fire Detectors. Fixed-temperature detectors. ...dels FT136 (factory-set to operate at 136°F), FT190 (190°F). ...ating contacts normally open. Contact ratings: 3 amp at ...25v d-c; 1.0 amp at 6–28v d-c; 0.3 amp at 125v d-c; 0.1 amp ...50v d-c.

...Alarms Inc 190 Fulton Ter New Haven 2 Conn

...Combination Rate-of-rise, Fixed-temperature Detectors. Models ...(factory-set to operate at 136°F), 52 (190°F). Operating ...acts normally open. Contact ratings: 3 amp at 6–125v a-c, ...amp at 6-28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

...Fixed-temperature Detectors. Models 53 (factory-set to oper... at 136°F), 54 (190°F). Operating contacts normally open. ...tact ratings: 3 amps at 6–125v a-c, 1.0 amp at 6 28v d-c, ...amp at 125v d-c, 0.1 amp at 250v d-c.

...well Co Newton Upper Falls 64 Mass

...Quick-Le-Stat Fixed-temperature Detector. Type D. Spot ...heat actuated. Operates an electrical switch when heat ...s a fusible element in a special type sprinkler head. Freed ...the fused element, a metal cap and compressed spring move a ...ger and operate a dual-control electric switch. Open or closed ...nits in outdoor as well as indoor installations may be set to ...ate to 100°, 212°, 286°, 360°F fixed temperatures.

...ell Corp Providence R I

...Grinnell Quartzoid Bulb Thermostat. Issue B. Spot type, ...ed temperature. It consists of two s...ring contacts mounted ...a molded bakelite base and is normally held in either open ...closed position by a standard quartzoid bulb. Rupture of the ...b releases the contact under tension and operates the thermo... controlling an electrical circuit. This device may be used to ...ate fire-extinguishing equipment or other electrical controls. ...bs are designed to rupture at 135°, 175°, 250°, 325°, 400° ...F fusel temperatures. Approved for outdoor or indoor installations. Available only on Grinnell special-hazard installations.

Minneapolis-Honeywell Regulator Co 2747 Fourth Av S Minneapolis 8 Minn

Automatic Fire Detectors. Combination rate-of-rise, fixed temperature. Types T464A1X1 (operates at 135°F), T464A2X1 (180°F). Operating contacts normally open. Contact ratings: 1.0 amp at 6–125v a-c or 6–24v d-c, 0.3 amp at 125v d-c.

Automatic Fire Detectors. Fixed temperature. Types T464B1X1 (operates at 135°F), T464B2X1 (180°). Operating contacts normally open. Contact ratings: 1.0 amp at 6–125v a-c or 6–24v d-c, 0.3 amp at 125v d-c.

Combination rate-of-rise, Fixed-temperature Detectors. Types T487A1003 (factory-set to operate at 136°F), T487A1011 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c.

Fixed-temperature Detectors. Types T487B1002 (factory-set to operate at 136°F), T487B1010 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Notifier Corp 3700 N 56th St Lincoln 4 Neb

Combination Rate-of-rise, Fixed-temperature Detectors. Models 501 (factory-set to operate at 136°F), 502 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c.

Fixed-temperature detectors. Models 503 (factory-set to operate at 136°F), 504 (190°F). Operating contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Protectowire Co Hanover Mass

Protectowire. Ratings: 155°, 185°, 270°F. (See Fire-alarm Systems, Automatic, Heat-actuated.)

Spurling Fire Alarm & Indicator Co Inc 100 High St Athens Tenn

Spurling Fire Watchman. Combination Rate-of-rise, Fixed-temperature Detectors. Models 31 (factory-set to operate at 136°F), 32 (190°F). Contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Spurling Fire Watchman Fixed-temperature detectors. Models 33 (factory-set to operate at 136°F), 34 (190°F). Contacts normally open. Contact ratings: 3 amp at 6–125v a-c, 1.0 amp at 6–28v d-c, 0.3 amp at 125v d-c, 0.1 amp at 250v d-c.

Stromberg Div of General Time Corp Thomaston Conn

Combination Rate-of-rise, Fixed-temperature Detectors. Models M-07703-A (factory-set to operate at 135°F), M-07704-A (190°F). Contacts normally open. Contact ratings: 1.0 amp at 6–24v d-c, 6–125v a-c; 0.3 amp at 125v d-c.

Fixed-temperature only. Models M-0705-A (factory-set to operate at 135°F), M-07504-A (180°F). Contacts normally open. Contact ratings: 1 amp at 24–125v a-c: 0.3 amp at 125v d-c.

BUILDING CONSTRUCTION

KALAMEIN FIRE DOORS

Doors of this type are of the flush or paneled design having a metal covered wood frame provided with insulated or wire-glass panels. The insulated panels consist of ¼-inch or thicker composition asbestos board covered with metal.

International Fireproof Door Co Inc 76-78 Lexington Av Brooklyn 5 N Y

Philipp Mfg Co Easthampton Mass

Pioneer Fireproof Door Corp 401 Washington Av Box 55 Carlstadt N J

Richmond Fireproof Door Co Inc Richmond Ind

St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 Mo

COMPOSITE FIRE DOORS

Doors of this type consist essentially of a noncombustible or fire-resistive core with untreated wood veneers or metal facings. Both sliding and swinging types available.

Dusing & Hunt Inc 1927 Elmwood Av Buffalo N Y

PyroDor 90-Minute Door Assembly. Models MU, CU. Door not to exceed 4 x 8 ft when mounted single, 7½ x 8 ft when mounted in pairs.

PyroDor 3-Hour Door Assembly. Models SA, AU. SA not to exceed 3 x 7 ft when mounted single, 6 x 7 ft when mounted in pairs AU restricted to single mount and not to exceed 4 x 8 ft.

PyroDor 3-Hour Door Assembly. Model SL. Sliding composite door consisting of mineral core with a steel channel frame, completely encased in a 24-gage metal covering. Single door for opening not to exceed 120 sq ft in area with no dimension exceeding 12 ft. Door assembly includes hardware and Pyromatic automatic door closer.

Hardwood Products Corp Neenah Wis

45-Minute Door Assembly. Weldwood mineral core encased in a treated wood-edge banding, completely covered with a thin untreated cross banding and face veneer. Flush type 1¾ in. thick and not over 4 x 7 ft. Equipped with a 30 x 36 in. wired-glass vision panel.

60-Minute Door Assembly. Weldwood mineral core encased in a treated wood-edge banding, completely covered with a thin untreated cross banding and face veneer. Flush type 1¾ in. thick and not over 4 x 7 ft. May be equipped with a vision panel not over 100 sq in.

F L Saino Mfg Co 66 W Colorado Av Memphis Tenn

45-Minute Door Assembly. Permaslab composite door consisting of mineral core with a steel channel frame, completely encased in a 24-gage all-welded metal covering. Flush type 1¾ in. thick. Not to exceed 3¾ x 7½ ft when mounted single, and 7½ x 7½ ft when mounted in pairs. Single door may be equipped with vision panel not over 100 sq in. Panels for doors in pairs limited to 50 sq in. in each leaf, or 100 sq in. for doors used singly.

90-Minute Door Assembly. Permaslab composite door consisting of mineral core with a steel channel frame, completely encased in 24-gage all-welded metal covering. Flush type 1¾ in. thick. Not to exceed 3¾ x 7½ ft when mounted single, and 7½ x 7½ ft when mounted in pairs. Single door may be equipped with vision panel not over 100 sq in. Panels for doors in pairs limited to 50 sq in. each leaf, or 100 sq in. for doors used singly.

3-Hour Door Assembly. Permaslab composite door consisting of mineral core within a steel channel frame, completely encased in a 22-gage all-welded metal covering. Flush type 1¾ in. thick. When provided with horizontal stiffeners, not to exceed 3½ x 7½ ft when mounted single, and 7 x 7½ ft when mounted in pairs. Doors without horizontal stiffeners not to exceed 3 x 7 ft when mounted single, and 6 x 7 ft when mounted in pairs.

U S Plywood Corp Door Div New York N Y

45-Minute Door Assembly. Weldwood mineral core encased in a treated wood-edge banding, completely covered with a thin untreated cross banding and face veneer. Flush type 1¾ in. thick and not over 4 x 7 ft. Equipped with a 30 x 36 in. wired-glass vision panel.

60-Minute Door Assembly. Weldwood mineral core encased in a treated wood-edge banding, completely covered with a thin untreated cross banding and face veneer. Flush type 1¾ in. thick and not over 4 x 7 ft. Door may be equipped with a vision panel not over 100 sq in. Also available with plastic foam.

Weyerhaeuser Co Marshfield Wis

45-Minute Door Assembly. Wood-chip core encased in a treated wood-edge banding, completely covered with a thin treated cross banding and untreated face veneer. Flush type 1¾ in. thick and not over 3½ x 7 ft. May be equipped with a wired glass vision panel not over 30 x 40 in.

60-Minute Door Assembly. Wood-chip core encased in a treated wood-edge banding, completely covered with three ply foam hardboard treated unexposed plies and untreated face veneer. Flush type 1¾ in. thick and not over 3½ x 7 ft.

60-Minute Door Assembly. Mineral core encased in a treated wood-edge banding, completely covered with a thin untreated cross banding and face veneer. Flush type 1¾ in. thick and not over 4 x 7 ft. May be equipped with a vision panel not over 100 sq in.

ROLLING STEEL FIRE DOORS

Doors of this type consist of a curtain of interlocking slats, bottom bars, counterbalancing mechanism, hood, brackets and operating mechanism. The curtain is constructed of 20-gage galvanized steel and may be operated by a chain, handle or crank. The door is designed to be mounted between jambs or on the face of a wall and closes automatically by fusing of a link attached to automatic release mechanism.

Abbotsford Co Inc 38-04 20th Av Long Island City 5 N Y

Abbotsford Rolling Steel Doors. Operated by handle, crank or chain.

...er Bullivar & Co Inc 404 Oakland St Brooklyn 22 N Y
...pes UN10, UJ10. Operated by handles.
...pes UN20, UJ20. Chain-operated.
...pes UN30, UJ30. Crank-operated.
...ans Co San Francisco Cal
...ypes FD-1, FD-4. Operated by handles.
...ype FD-2. Chain-operated.
...ype FD-3. Crank-operated.
...ell Iron Works Inc 3600 13th St Long Island City N Y
...ervice Nos. 1A, 2A, 3A.
...s. 11A, 12A, 13A. Chain-operated.
...s. 21A, 22A, 23A. Crank-operated.
...ator Mfg Co Columbus O
...ator doors.
...perior shutters.
...Mahon Co Box 4666 Detroit 34 Mich
...ype 300ML. Push-up operated.
...ard-Edwards Corrugating Co Covington Ky
...ypes 100, 104, 200, 210, 300, 310. Operated by handles.
...ypes 102, 205, 305. Chain-operated.
...ypes 102, 206, 306. Crank-and-gear operated.
...h American Door Co Inc Box 27 Lindenhurst N Y
...ype NAIBCO 1A. Lift-hand operated.
...ype NAIBCO 11A. Chain-operated.
...ic Rolling Door Co 400 Derby Av Oakland 1 Cal
...Model Nos. PFL-50, PJL-50, PJL-70. Manual with handles.
...Model No. CFL-50. Chain-operated.
...Model No. KFL-50. Crank-operated.
...n Wilson Corp 370 Lexington Av New York N Y
...Model Nos. 1704, 1706, 1710, 1711, 1713, 1721, 1723. Operated ...handles.
...Model Nos. 1707, 1715, 1727. Crank-operated.

SHEET-METAL FIRE DOORS, Insulated, Standard

Standard insulated sheet-metal sliding and swinging ...e doors are of the corrugated or flush design and ...sist of insulated steel sheets riveted or spot welded ...a steel frame. The corrugated doors have two face ...eets of galvanized corrugated steel, with the corru...ations at right angles to each other, and separated by ...layer of asbestos paper. The flush doors are covered ...h both faces with sheets of flat steel. The insulation ...nsists of a layer of asbestos paper or the hollow spaces ...tween the vertical stiffeners are filled with loose ...sbestos.

...ower Mfg Co Columbus O
...Herbert & Evans Co 2035 Washington Av Philadelphia Pa
...M & E Alnetl.
...Richards-Wilcox Mfg Co Inc Aurora Ill
...FyeR-Wall and FyeR-Ward.
...Richmond Fireproof Door Co Inc Richmond Ind
...St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 Mo
...Street-Dor.

SHEET-METAL FIRE DOORS, Insulated, with Vision Panel and Transom

Doors of this type are suitable for protection of openings in all but first-class fire walls, and elevator or stair enclosure walls.

Richards-Wilcox Mfg Co Inc Aurora Ill
FyeR-Ward.

FIRE DOORS Fire Resistance and Recommended Uses of Various Types	Maximum Size Opening			Useful Fire Resistance, Hrs.	Max. Wired-Glass Area, Sq. In.	Largest Glass Dimension, In.
	Area, Sq. Ft.	Height, Ft.	Width, Ft.			
KALAMEIN						
Stairtowers and Partitions						
Swinging Single		8	4	¾-1	100	12
Swinging in Pairs		8	8	¾-1	100	12
COMPOSITE						
Stairtowers and Partitions						
Swinging Single		7-8	4	¾, 1, 1½	100-120	12
		8	7½	1,1½	—	—
Swinging in Pairs						
Firewalls		8	4	3	None	—
Swinging Single		7	6	3	None	—
Swinging in Pairs	120	12	12	3	None	—
Sliding Single						
ROLLING STEEL						
Firewalls, Elevator Shafts, Partitions and Exterior Walls						
SHEET METAL, Insulated						
Firewalls						
Sliding Single	120	12	12	3	—	—
Sliding Double, doors on both sides of the wall opening	120	12	12	4	—	—
Sliding in Pairs	120	12	12	3	—	—
Swinging Single	70	12	6	3	—	—
Swinging in Pairs	120	12	12	3	—	—
Elevator Shafts, Stairtowers, Partitions and Exterior Walls						
Sliding Single	120	12	12	1½	100	12
Sliding in Pairs	120	12	12	1½	100	12
Swinging Single	70	12	6	1½	100	12
Swinging in Pairs	120	12	12	1½	100	12
SHEET METAL, Uninsulated						
Elevator Shafts						
Vertical Sliding, Counterbalanced, or Telescoping	80	10	8	1½	100	12
METAL-CLAD 3-PLY						
Firewalls						
Sliding Single	120	12	12	3	—	—
Sliding Double, doors on both sides of the wall opening	120	12	12	4	—	—
Sliding in Pairs	120	12	12	3	—	—
Swinging Single	70	12	6	3	—	—
Swinging in Pairs	120	12	12	3	—	—
METAL-CLAD 3-PLY						
Elevator Shafts, Stairtowers and Partitions						
Sliding Single	80	10	10	1½	100	12
Swinging Single	—	10	4	1½	100	12
Swinging in Pairs	80	10	8	1½	100	12
Vertical Sliding, Counterbalanced, Pass or Telescoping	80	10	8	1½	100	12
HOLLOW METAL						
Vertical Shafts, Corridor or Room Partitions and Exterior Walls						
Swinging Single		10	4	1½	100	12
Swinging in Pairs		8	10	1½	100	12

SHEET-METAL FIRE DOORS, Uninsulated, For Elevators

Uninsulated sheet-metal fire doors for elevators are two-piece, vertically sliding, counterbalanced or telescoping. Except where noted otherwise, they consist of a single thickness of galvanized sheet steel, corrugated or plain, riveted or welded in a structural steel frame.

Harris Preble Fire Doors Inc 4608-14 W 20th St Chicago Ill
Model Insulated-panel super-duty M-1. With neoprene safety astragal.
Models Super-duty M-2, M-2F. With neoprene safety astragal.

Poelle Co Inc 47 Stewart Ave Brooklyn 37 N Y
With neoprene safety astragal.

St Louis Fire Door Co Inc 4270 Sullivan Ave St Louis 15 Mo
Wal-El-Dor. Co-Bal-Dor. With ASA safety rail. S-RP. Flanged, interlocking, replaceable sheet-steel panels. Flush.

Security Fire Door Co 3036 Lambdin Av St Louis Mo
Seco-Door. Seo-Tel-Dor. With security safety meeting rails.

Simplex Door Co 1325 W Belmont Av Chicago 13 Ill

METAL-CLAD FIRE DOORS, Standard

Standard sliding and swinging metal-clad fire doors consist of a two- or three-ply core of well-seasoned wood covered with lock-jointed terneplate, Ductillite, or 30-gage sheet steel. In addition the covering is nailed to the core.

American Metal Door Co Inc 615-621 South H St Richmond Ind

Boston Metal Door Co Inc 87 Fawcett St Cambridge 38 Mass

Buffalo Fire Door Co Inc 175 Great Arrow Av Buffalo 7 N Y

Dusing & Hunt Inc 1927 Elmwood Av Buffalo N Y

International Fireproof Door Co Inc 76-78 Lexington Av Brooklyn 5 N Y

George T McLauthlin Co 120 Fulton St Boston Mass

Philipp Manufacturing Co Easthampton Mass

Pioneer Fireproof Door Corp 401 Washington Av Box 55 Carlstadt N J

Richards-Wilcox Mfg Co Inc Aurora Ill

Richmond Fireproof Door Co Inc Richmond Ind

F L Saino Mfg Co 66 W Colorado Av Memphis Tenn

St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 Mo

Security Fire Door Co 3036 Lambdin Av St Louis Mo

METAL-CLAD FIRE DOORS, for Freight Elevators

Metal-clad fire doors for freight elevators are two-piece vertically sliding, counterbalanced, bi-parting or telescoping. They have a two-ply core of well-seasoned wood covered with lock-jointed terneplate, Ductillite, or 30-gage sheet steel.

Harris Preble Fire Doors Inc 4608-14 W 20th St Chicago Ill
Model Metal Clad M-3. With neoprene safety astragal.

Poelle Co Inc 47 Stewart Av Brooklyn 37 N Y
R-6, R-7, R-8, R-9, R-10. Metal-clad elevator-door [illegible] with neoprene safety astragal.

St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 [illegible]
Wal-El-Dor. Tico-Dor. With ASA safety rail.

Security Fire Door Co 3036 Lambdin Av St Louis Mo
Seco-Door. Seo-Tel-Dor. With security safety meeting [illegible]

Simplex Door Co 1325 W Belmont Av Chicago 13 Ill
Metal Clad.

HOLLOW-METAL FIRE DOORS

Doors of this type are of the flush or paneled [illegible] having a metal outer shell filled with a noncombustible insulating material. The insulated panels consist of composition asbestos board covered with metal.

Pioneer Fireproof Door Corp 401 Washington Av Box Carlstadt N J

Richmond Fireproof Door Co Inc Richmond Ind
Richmond. Types MD, FD, FA.

Superior Fireproof Door & Sash Co Inc 4175 Park Av [illegible] 57 N Y

HOLLOW-METAL FIRE DOORS, for Freight Elevators

The following listing covers a bi-parting hollow-metal fire door for freight elevators.

St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 Mo
HM-1. Flush, hollow-metal insulated panels.

FIRE-DOOR HARDWARE

Hardware for repairs to fire doors and shutters can be obtained from the following manufacturers. Order, if possible, from the original manufacturer, and specify the type, size, and thickness of the door.

Allith-Prouty Inc Danville Ill
Allith A.

Boston Metal Door Co Inc 87 Fawcett St Cambridge 38 Mass

Coburn Products Dept Wickwire Spencer Steel Div of Colorado Fuel & Iron Corp Box 311 Palmer Mass
Coburn A.

Poelle Co Inc 47 Stewart Ave Brooklyn 37 N Y
Elevator-door Safety Astragal.

Jas Peters & Sons 1934 N Front St Philadelphia Pa
Peters A.

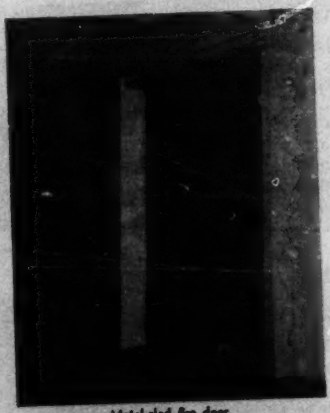
Richards-Wilcox Mfg Co Inc Aurora Ill
Nos. 102, 201, 303, 304, 302, 303, 304, 406, 503, 641, 643, 1102, 1201, 1303, 1304, 1406, 1506, 1641, 1645, 1646, 2102, 2303, 2304, 2406, 2506, 2641, 2645, 2646.

Richmond Fireproof Door Co Inc Richmond Ind
Richmond A-20.

St Louis Fire Door Co Inc 4270 Sullivan Av St Louis 15 Mo

Asbestos fire door.

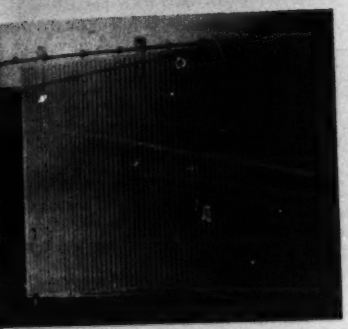
Composite fire door.



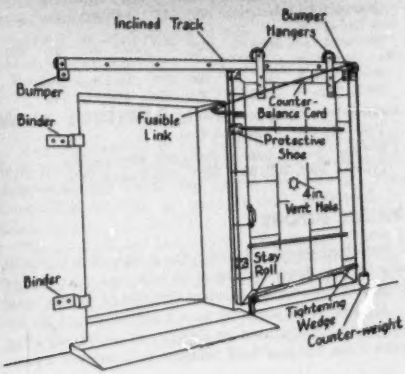
Metal-clad fire door.

Rolling-steel galvanized fire door.

Metal-clad elevator fire door.



Sheet-metal fire door.



DOOR-CLOSING DEVICE, Heat-actuated

This door closer is designed to close swinging fire doors automatically. The device is attached to a special door-closer arm which permits the door to be held open when desired and to close automatically when the surrounding temperature is above 135°F. It is approved for use on swinging fire doors that protect openings in fire walls or partitions having a fire-resistance rating of three hours or less.

Derby Devices Inc 118 Quinnipiac Av North Haven Conn
Derby Heat-actuated Device for Door Closers.

FUSIBLE LINKS

Approved fusible links are used to operate fire doors, shutters, dampers, and other devices at a predetermined temperature. They are also used for the automatic operation of special fire-protective equipment releasing water, carbon dioxide, foam, and other extinguishing materials.

The fusible type link consists mainly of two bronze plates joined together by a special solder alloy. The solder melts at a predetermined temperature allowing the plates to separate. Other types of approved links operate by the bursting of a glass bulb due to the expansion of an enclosed liquid or the liquefying of a chemical compound when exposed to heat.

When ordering, the proposed load to which the link will be subjected and the maximum expected temperature should be specified.

Globe Automatic Sprinkler Co Div of Fyr-Fyter Co Route No 1 Box 750 Newark 1 N J
Globe Model B. 135°, 165°, 212°, 280°, 360°. Max load 20 lb.
Globe Saveall. 135°, 150°, 175°, 212°, 280°, 340°, 415°. Max load 20 lb.
Globe Model D. 135°, 165°, 212°, 286°, 360°. Max load 8 lb.

Grinnell Corp Providence R I
Quartzoid Link Issue B. 135°, 175°, 250°, 325°, 400°, 500°. Max load 250 lb.
Quartzoid Link Issue C. 135°, 175°, 250°, 325°, 400°, 500°. Max. load 500 lb.
Solder Type A. 165°, 212°, 286°, 350°. Max load 20 lb.
Solder Type B. 165°, 212°, 286°, 350°. Max load 3 lb.

Richards-Wilcox Mfg Co Aurora Ill
Type 006. 160°. Max load 20 lb.

J W Yates Box 61 Coconut Grove Sta Miami 33 Fla
Type A. 160°, 212°, 280°, 360°. Max loads 8, 15 lb.

VAULT DOORS

Standard specifications for the construction of vaults require that doors shall be of an approved type, having a specific fire-resistance rating established by fire tests.

A vault in or attached to a building should be designed and constructed so that it will remain standing even if the building itself collapses as a result of a complete burnout. The doors must be adequate to fire under such conditions. The following are recommended:

½-hour door — Records of slight value or those replaceable.

2-hour door — Provides reasonable protection if located in or above the second story above basement or ground story.

4-hour door — Provides protection for vaults located ground or first story of multi-story building.

6-hour door — Provides maximum practical resistance should be used where a serious and prolonged fire exposure is expected.

Diebold Inc Canton O
½-hour, 1-hour, 2-hour, 4-hour, 6-hour.

Mosler Safe Co Hamilton O
½-hour, 1-hour, 2-hour, 4-hour, 6-hour.

SAFES

For keeping valuable records in small quantities approved portable safes give good protection against fire damage and may be located on any floor of a building. Records kept in an approved safe of proper rating will be protected against fire or resulting building collapse. Contents are susceptible to water damage following collapse of a building if the safe lands in a flooded basement area. The probable time of an exposure fire should be specified when placing the order in accordance with the following recommended schedule:

1 hour — Records of slight value or those readily replaceable and if container is located in a building not exceeding two stories.

2 hour — Gives reasonable protection if combustible building construction and contents in all stories do not exceed 50 pounds per square foot of ground area.

4 hour — Provides maximum practical resistance and should be used if combustible construction and contents in all stories exceed 50 pounds per square foot of ground area.

Diebold Inc Canton O
1-hour, 2-hour, 4-hour.

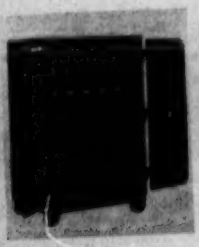
Mosler Safe Co Hamilton O
1-hour Record Container. 1-hour safe, Class B. 2-hour safe, Class A. 4-hour safe.

EXPLOSION-VENTING WINDOWS

Explosion-venting windows are recommended when the building contains processes involving flammable dusts or vapors. If sufficient window-venting area can be provided, the pressure of an explosion can be released before it causes serious damage to the main building structure.

In the top-pivoted type, the entire window swings outward when an explosion occurs, and then drops back into position.

Vault door.



Safe.

Explosion-venting windows.

Wall scupper.

Fusible links.

Heat-actuated door-closing device.

Protected metal sheet.

Fire-retardant plastic panels on monitor roof.

The projected type has a section which opens when tively slight pressure forces friction shoes at the top ers to slide down a vertical track, while a guide arm mits the section to swing outward to a horizontal tion.

Latches are provided on these windows, so arranged t a small internal pressure permits the window to n. It is not reasonable to expect these latches to e sufficient sensitivity for effective explosion venting hout releasing due to suction pressures on leeward dows during windstorms. It may therefore be essary to close and latch some explosion-venting dows during severe windstorms.

Bayley Co 1300 Warder St Springfield O
Projected Type with Pressure Release Latch H64.

Steel Products Corp 3601 W 26th St Chicago 50 Ill
Projected Type with Explosion Latch 7810 or Kick Lock 5411H.

Vertical Windows Mfg Co Inc Waukesha Wis
Projected Type.

Steel Pipe Mfg Co Tabor Rd & Godfrey Av Philadelphia Pa
Projected Type.

METAL WINDOW SASH

Metal window frames, now widely used in modern construction, are especially desirable where nearby combustible buildings provide a slight to moderate exposure-fire hazard. Blank brick fire walls are needed for protection against severe exposure fires.

Solid rolled metal windows are manufactured in single or multiple sections and in stationary, counterbalanced, and ventilator types. Single sections are limited to a 7- by 12-foot size unless reinforced by protected vertical T-bar mullion sections. Frames should be well anchored into the building walls. Quarter-inch wire glass is used and each pane is limited to an area of 720 square inches exposed area with horizontal and vertical dimensions limited to 48 and 54 in. respectively. The glass is set with glazing angles to prevent its displacement by fire.

Federal Windows Mfg Co Inc Waukesha Wis
Federal.

WALL SCUPPERS

Wall scuppers aid in the prompt disposal of water from sprinklers or hose streams. Used in conjunction with watertight floors, they reduce floor leakage, thus minimizing damage to material and equipment in lower stories.

The arrangement and number of scuppers depends upon the probable amount of water used during a fire, the watertightness of the floor, and the possible water damage to materials.

Scuppers are constructed of cast iron with bronze clappers pivoted on bronze pins to prevent entrance of

wind. The water-inlet end is an enlarged tapered opening protected by a suitable grating. The water channel is a 4-inch square opening having a downward pitch. A projected hood on the outlet prevents clogging by snow and ice and acts as a wind break.

Sargent Building Specialties Inc 610-12 Devon St Arlington N J

FIRE-RETARDANT PLASTIC PANELS

Translucent reinforced structural plastic panels have a combustibility reduced to a satisfactory degree in conformance with Factory Mutual approval standards. Use of the panels is subject to the standards of the Factory Mutual Engineering Division.

Alsynite Co of America 4654 DeSoto St San Diego 9 Cal
Alsynite FR-150.
Alsynite FR-200.

Barclite Corp of America Barclay Bldg 385 Gerard Av Bronx 51 N Y
Barclite F.R. 1½ oz, 2 oz, 3 oz.

Butler Mfg Co 7400 E 13th St Kansas City 26 Mo
Stylux and Lite-Panl. 1½ oz, 2 oz, 3 oz. Uncoated or coated one side with acrylic lacquer. Coated surface should be exposed to weather.

Fiberglas Canada Ltd 247 York Rd Guelph Ont
Firetard FR-150.
Firetard FR-200.
Firetard FR-300.

Filon Plastics Corp 333 No Van Ness Av Hawthorne Cal
Filon Type 900.
Filon Type 905.
Filon Type 600.
Filon Type 605.

Ipcor Plastics Inc Box 391 Branford Conn
Ipcor Series A22S.
Ipcor Series A20P.
Ipcor Series A30.

Johns-Manville Fiber Glass Inc Box 20026 Houston 25 Texas
Corrulux Type II.

Kemlite Corp 101 N Republic Av Joliet Ill
Fire-X Glasbord. 1½ oz, 2 oz, 3 oz.

Lasco Industries 2939 S Sunol Dr Los Angeles 23 Cal
Lascolite Fire-Block, Standard and Heavyweight.

Resolite Corp Zelienople Pa
Resolite Fire-Snuf.

Rippolite Plastic Products Inc 3919 Calument St Burbank
Rippolite. 1½, 3 oz.

Structoglas Inc 11701 Shaker Blvd Cleveland 20 O
Structoglas SE.

U S Plywood Corp 55 W 44th St New York 36 N Y
Weldwood Fire Retardant Fiberglas Paneling.

PROTECTED METAL SHEETS

Protected metal sheets are approved when fabricated and controlled as described in their respective approval reports. These fire-retardant sheets have a combustibility reduced to a satisfactory degree in conformance with Factory Mutual approval. Their use is subject to the standards of the Factory Mutual Engineering Division.

Bowman Steel Corp Box 2129 Pittsburgh 30 Pa
Steelbestos and Color Steelbestos.

Manta Vin-Cor Steel Corp 7525 S Chicago Av Chicago 19 Ill
Vin-Cor Panels.

H H Robertson Co Pittsburgh Pa
Standard Galbestos C18.
Standard Galbestos C28.
Color Galbestos C18.
Color Galbestos C28.

FIRE-RETARDANT TREATED LUMBER

Lumber is approved as fire-retardant when it is treated by pressure impregnation with chemicals which reduce its combustibility to a satisfactory degree in conformance with Factory Mutual approval standards. Use of this material is subject to the standards of the Factory Mutual Engineering Division.

Koppers Co Inc Wood Preserving Div Pittsburgh 19 Pa
Non-Com.

Protexol Corp Kenilworth N J
Protexol B.

FLAMMABLE-LIQUID EQUIPMENT

L AND VENT FITTINGS for Storage Tanks

proved fill and vent fittings designed primarily for with underground storage tanks employ a perfor- metal double-wall flame arrester to prevent flame agation. The fittings can be used with above- d storage tanks in conjunction with separate vent . When installed with arresters long enough to tank bottoms the fittings enable the taking of ing and sampling readings.

tosseal Co 1920 S Western Av Chicago 8 Ill
tosseal. Models 122, 123, 124.

y Supply Co 214 King St E Toronto 2 Ont
tosseal. Models 122, 123, 124.

L AND VENT FITTINGS for Vehicle Gaso- line Tanks

Gasoline tanks on industrial vehicles should be filled er the safest possible conditions. An approved fill vent fitting consists of two perforated brass sheets d into a tube and closed at the bottom. This struction prevents flame from fires outside the tank hing the vapors in the tank and igniting them. A ed swivel cap, normally spring-closed and equipped h a vacuum relief is fastened at the top. The cap ked in place by an auxiliary spring which is placed that it also provides pressure relief in the event of ssure fire.

When ordering give the manufacturer the following rmation: (1) diameter of fill pipe or flange, (2) size thread (male or female), (3) distance bottom of tank top of filler pipe or flange, (4) distance top of tank to of filler pipe or flange, (5) distance top of filler pipe start curved portion of pipe (if any).

Special designs can also be supplied to fit odd-shaped nks.

tosseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Fill and Vent Connection for Gasoline Fuel Tanks. t Nos. 1250-67 (threaded connections). Cat Nos. 2062, 2066, 2, 398, EX985 (lug or Easy-On) flange fittings. Equipped with ing spring feature.

ty Supply Co 214 King St E Toronto 2 Ont
Protectoseal Fill and Vent Connection for Gasoline Fuel Tanks. t Nos. 1250-67 (threaded connections). Cat Nos. 2062, 2066, 2, 398, EX985 (lug or Easy-On) flange fittings. Equipped with ing spring feature.

DIRECT-CONNECTION FILL UNITS

These fittings are used where storage tank is to be filled by direct connection from tank trucks or railroad tank cars and a tight, direct connection is desired. They employ a perforated metal double-wall type flame arrester designed to prevent flame propagation.

This unit is also suited for installation where short length flame arresters are necessary.

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Direct-connection Fill Units. Cat Nos. 509, 510 515, 519, 520.

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Direct-connection Fill Units. Cat Nos. 509, 510, 515, 519, 520.

TEMPORARY BARREL FILLS

An approved funnel is safer than an ordinary funnel when drums are being filled with flammable liquids. The approved funnel consists of a double-walled, conical-shaped section so arranged that it releases air from the drum and permits an increased filling rate. The lower section is a double cylinder of perforated sheet brass which acts as an arrester to prevent flames above the funnel from igniting vapors in the drum.

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Temporary Barrel Fill. Cat No. 508A.

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Temporary Barrel Fill. Cat No. 508A.

FLAME ARRESTERS for Storage-tank Vent Pipes

Approved flame arresters installed at or near the end of vent pipes attached to flammable-liquid storage tanks prevent an outside flame from entering the tank. They may or may not be equipped with automatic conservation valves designed to minimize vapor loss due to evaporation. The arresting elements consist of fine mesh wire screens, bar or sheet grids which act as cooling surfaces to absorb the heat of the flame.

Flame arresters should be provided at vents on (a) all tanks containing liquids with flash points below 110°F and (b) on aboveground tanks containing liquids with flash points higher than 110°F if they are close to

combustible material or other tanks containing liquids with flash points below 110°F. The size of the flame arrester should meet the requirements for approved venting of storage tanks.

The following equipment is suitable for vent lines of all common flammable liquid storage tanks *except carbon disulphide and ethyl ether*.

Black Sivalls & Bryson Inc 7500 E 12th St Kansas City Mo

Flame Arrester. Model VVFA. 2, 3, 4, 6 in. Combination flame arrester and pressure-vacuum vent valve. The vent valves are subject to external loading. In applying, consideration should be given to climatic conditions and possible snow loading.

Flame Arrester. Type 76-18. 6, 8, 10 in.

Johnston & Jennings Co Div of Pettibone Mulliken Corp Oceco Div 4700 W Division St Chicago 51 Ill

Oceco Flame Arrester. Cat Types 21-E (extensible bank), 21-F (fixed bank).

Conservation Vent Units. Cat Types BE, BF. Comprises conservation vent valve Cat Type V-113 and flame arrester Types 21-E or 21-F, respectively. Vent Units. Cat Types AE, AF consist of weather hood Cat Type W-3 and flame arrester Types 21-E or 21-F, respectively.

All the above are approved in the 2, 3, 4, 6, 8, 10 in. sizes.

Protectoseal Co 1920 S Western Av Chicago 8 Ill

Protectoseal Grid-type Vent Arrester with Conservation Unit. Nos. 832B (2 in.), 833B (3 in.), 834B (4 in.), 836B (6 in.), 838A (8 in.).

Protectoseal Grid-type Vent Arrester without Conservation Unit. Nos. 862 B (2 in.), 863B (3 in.), 864B (4 in.), 866B (6 in.).

Safety Supply Co 14 King St E Toronto 2 Ont

Protectoseal Grid-type Vent Arrester with Conservation Unit. Nos. 832B (2 in.), 833B (3 in.), 834B (4 in.), 836B (6 in.), 838A (8 in.).

Protectoseal Grid-type Vent Arrester without Conservation Unit. Nos. 862B (2 in.), 863B (3 in.), 864B (4 in.), 866B (6 in.).

Shand & Jurs Co 2600 Eighth St Berkeley 10 Cal

Flame Arrester. Fig. ST-863-E (2, 3, 4, 6, 8, 10, 12 in.). Fig. ST-4300-A (2, 3, 4, 6, 8 in.). Used with vapor conservation valves Figs. ST-3695-R or ST-6049 or weather-protection hood Fig. ST-420 as applicable.

Vapor Recovery Systems Co 2320 N Alameda St Compton Cal

Varec Flame Arrester. Fig. 50. 2, 2½, 3, 4, 6 in. Vertical type.

Varec Flame Arrester. Fig. 53. 2, 2½, 3, 4, 6 in. Horizontal type.

FLAME ARRESTERS for Carburetor Air Intakes

Flame arresters are used on autos, trucks, tractors, and other internal combustion engines for cleaning the intake air and to prevent backfires in the intake manifold from reaching and igniting oil, grease, etc., that may have accumulated on the engine in the vicinity of the air intake. Occasional cleaning is required.

Air-Maze Corp Cleveland O

Unimaze Air Filter. Model OH. Sizes 1 to 8.

Air-Maze Oil-bath-type Filter. Model AOB. Sizes 1 to 8. Models F25 through F550.

Types R-82, R-82S, R-82A. ¾-in. thick in areas up to 400 sq in.

Oberdorfer Foundries Inc Syracuse N Y

Oberdorfer Back-fire Trap. Sizes 1, 3, 6.

LIQUID-LEVEL GAGES, Indirect-reading for Liquids with or without Pressure

The approved indirect-reading liquid level gages suitable for the measurement of hazardous liquids in storage tanks vented to atmospheric pressures, in closed tanks at pressures up to 25 psi. They should not be used on tanks that are subject to fluctuating temperatures of the liquid to be measured. Indicating-reading gages are available which may be mounted on the tank and/or at a remote location.

King Engineering Corp Ann Arbor Mich

Hydrostatic Gage. Models TM, TE, TG. Remote reading.

Liquidometer Corp Skillman Av at 37th St Long Island City N Y

Liquidometer Float-actuated Gage. For tank mounting for reading, or recording. Tank pressure 15 psi max.

Indicators. 216H, 216V. Used as part of the Liquidometer gaging system.

Petrometer Corp 43-22 Tenth St Long Island City N Y

Petrometer Hydrostatic Gage. Series 1400. Models A, B, F. Types 422 through 446, 552 through 555. If tank is pressured recommend normal 7 psi max. Remote reading.

LIQUID-LEVEL GAGES, Indirect-reading for Liquids without Pressure

Contents of tanks used for the storing or processing of liquids at atmospheric pressures may be measured with a hydrostatic-type or float-type gage. The hydrostatic-type design permits locating the gage at a distance from the tank.

Liquidometer Corp Skillman Av at 37th St Long Island City N Y

Levelometer Hydrostatic Gage. Midget, small, large, and recording.

Petrometer Corp 43-22 Tenth St Long Island City N Y

Petrometer Hydrostatic Gage. Model 1329. With or without safety cleanout valve 1425.

Pneumercator Co Inc 305 E 46th St New York 17 N Y

Hydrostatic Gage. Model BU. Adjustable.

Safety Gage Co 4622 Forest Av Kansas City Mo

Float-actuated Gage. Type A.

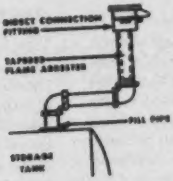
LIQUID-LEVEL GAGES, Direct-reading for Liquids with or without Pressure

These gages consist of a thick flat plate of heat-resisting glass set in a heavy metal housing designed to minimize mechanical injury. However, manual valves must be used between the tank and gage to prohibit liquid loss in the event of gage rupture or misplacement. The gages are of the reflex type with the inner surface of the glass being fluted. Ambient light is reflected from the flute faces except where they are covered with liquid.

Jerguson Gage & Valve Co Adams St Burlington Mass

Jerguson Liquid-level Gages. Types R-5, R-20, RF-20, RL-10, TL-10. For applications not exceeding 250 psi at 400°F or 450 psi at 100°F.

Flame arrester, carburetor air intake.

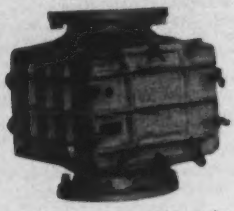


Direct-connection fill unit.

Fill and vent fitting, vehicle gasoline tank.

Flame arrester, storage-tank vent pipe.

Flame arrester, storage-tank vent pipe.

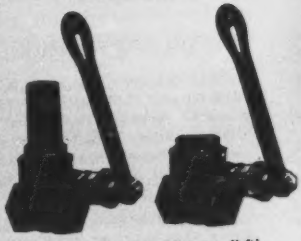


Flame arrester, storage-tank vent pipe.

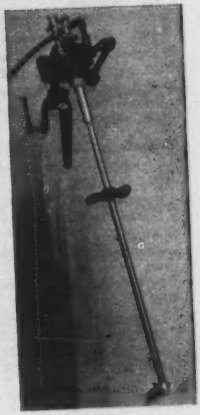
Self-closing faucets.

Safety bungs.

Manual drum pump.



Quick-closing valve, self-closing (left), manual-closing (right).



Liquid mixer.

SELF-CLOSING FAUCETS

Self-closing faucets are used for dispensing common flammable liquids from drums. They are automatically self-closing to prevent the valve being left open after use. Approved faucets are equipped with flame arresting screens to protect against ignition of vapors inside the drum. An approved safety bung should be provided for the bung opening used to relieve vacuum created by dispensing operations.

Some organic solvents or acidic materials may seriously corrode working parts or cause other deterioration to valve seats, packing or gaskets unless those parts are especially made to service such liquids. The purchaser should specify service when ordering faucets.

Economy Faucet Co 12 New York Av Newark N J

Universal Non-drip Faucets. Model U009 (with Teflon seal). For volatile and many corrosive fluids. ¾ in. ips. Stainless-steel body. Can be chemically or steam sterilized. Standard faucet head available with interchangeable shanks. Also available in chrome-plated brass.

Imperial Brass Mfg Co 6300 W Howard St Chicago 31 Ill

Model 269-G. Without flame arrester. For use with viscous liquids.

Model 270-G. With flame arrester. With polyethylene seat. For use with volatile liquids.

Protectoseal Co 1920 S Western Av Chicago 8 Ill

Protectoseal Swivel Faucet. Model X506H. Die cast zinc and steel. ¾ in. ips.

Protectoseal Swivel Faucet. Model X506E. Brass. ¾ in. ips.

Protectoseal Swivel Faucet. Model XF506E. Stainless Steel. ¾ in. ips.

Protectoseal Nonswivel Faucets. Models T531, N531, X531E. Brass. ¾ in. ips.

Protectoseal Nonswivel Faucet. Model XF531E. Stainless Steel. ¾ in. ips.

Letter X before model number indicates a Teflon O ring. Letters T and N refer to Thiokol and Neoprene gaskets.

Protectoseal Flexible Metal Hose. Models 5706 (6 in. length), 5712 (12 in. length), 5718 (18 in. length). Available in galvanized steel, brass or stainless steel. Can be used with above faucets except Model X-506-H for which hose must be ordered at time of original purchase.

Safety Supply Co 214 King St E Toronto 2 Ont

Protectoseal Swivel Faucet. Model X506H. Die cast zinc and steel. ¾ in. ips.

Protectoseal Swivel Faucet. Model X506E. Brass. ¾ in. ips.

Protectoseal Swivel Faucet. Model XF506E. Stainless Steel. ¾ in. ips.

Protectoseal Nonswivel Faucets. Models T531, N531, X531E. Brass. ¾ in. ips.

Protectoseal Nonswivel Faucet. Model XF531E. Stainless Steel. ¾ in. ips.

Letter X before model number indicates a Teflon O ring. Letters T and N refer to Thiokol and Neoprene gaskets.

Protectoseal Flexible Metal Hose. Models 5706 (6 in. length), 5712 (12 in. length), 5718 (18 in. length). Available in galvanized steel, brass or stainless steel. Can be used with above faucets except Model X-506-H for which hose must be ordered at time of original purchase.

SAFETY BUNGS

Safety bungs for steel shipping and storage drums for flammable liquids are designed to prevent bursting of the containers under fire exposure conditions with sprinklers in service. Excess internal pressure is relieved at 5 to 35 psi, depending upon the type of bung. Some flammable vapors thus released may burn outside the drum, but flame is prevented from propagating to the contents by a flame arrester of the screen or plate type. Except as noted they are not designed to protect drums containing carbon disulphide or ethyl ether.

Flammable liquid drums used in manufacturing processes for the storage and handling of liquids with a closed cup flashpoint below 100° F. should be equipped with approved safety bungs.

Central Safety Equipment Co 6601 Marsden St Philadelphia 35 Pa

Vent-A-Drum. Model C. 2 in.

Blo-Vent. Combination Safety Bung and Pressure- and Vacuum-relief. Model C. 2 in.

OPW Corp 2735 Colerain Av Cincinnati 25 O

Safety Bungs. No. 298. 2 in. 15 and 35 lb ratings.

Protectoseal Co 1920 S Western Av Chicago 8 Ill

Protectoseal Combination Drum Vent and Fill Unit. No. 5001 (1½ in.), 500 (2 in.).

Protectoseal Combination Drum Vent and Fill Unit. No. 5001 (1½ in.), 5000 (2 in.), Can be used on carbon disulphide and ethyl-ether drums.

Protectoseal Combination Drum Vent and Fill Unit. No. 5000 2 in. With funnel attachment.

Protectoseal Plate-type Drum Vent. No. 522. 2 in.

Protectoseal Drum Vent. No. 5522. 2 in. For bung opening located at the end of horizontally stored drums.

Safety Supply Co 214 King St E Toronto 2 Ont

Protectoseal Combination Drum Vent and Fill Unit. No. 5001 (1½ in.), 500 (2 in.).)

Protectoseal Combination Drum Vent and Fill Unit. No. 5001 (1½ in.), 5000 (2 in.). Can be used on carbon disulphide and ethyl-ether drums.

Protectoseal Combination Drum Vent and Fill Unit. No. 5000 2 in. With funnel attachment.

Protectoseal Plate-type Drum Vent. No. 522. 2 in.

Protectoseal Drum Vent. No. 5522. 2 in. For bung opening located at the end of horizontally stored drums.

MANUAL DRUM PUMPS

Hand-operated drum pumps consist essentially of a pumping unit equipped with discharge fittings and means for mounting in the bung opening of a drum. The usual design is such that an effective vapor seal is maintained between the pump discharge outlet and the drum interior, otherwise the discharge opening is protected with a flame arrester.

It is recommended that safety bungs be used in drums when the pump is not equipped with a pressure and vacuum relief vent.

...ctional Co 1920 S Western Av Chicago 8 Ill
...ctional Hand-transfer Pump. Models 4500, 4500-80 (with ...nnels and drip pan), 4500-90 (with 6-ft hose and vacuum ...ge).

...y Supply Co 214 King St E Toronto 2 Ont
...ctional Hand-transfer Pump. Models 4500, 4500-80 (with ...nnels and drip pan), 4500-90 (with 6-ft hose and vacuum ...ge).

...ion Corp Fort Wayne 1 Ind
...h Vacuum Hand Pumps. Models 606, 609.

...UID MIXERS

...gitators driven by air motors are recommended for ...ng small batches of flammable materials such as ...nts, inks, lubricating oils, and lacquers. They are ...rable to electrically driven agitators because they ...inate the possibility of ignition from wires, switches, ...motors. They are suggested for use wherever there ...be exposure to explosive vapors or materials. ...d mixing tanks should be grounded, and agitators ...fastened to the tanks to prevent the possibility of ...mulating static charges by propeller friction. Pro... ...rs should be of non-ferrous metal where solvents ...e a flash point of less than 110°F or where materials ...to be heated within 40°F of the flash point. Avail... ...e in several sizes and types.

...on Air Brush Co Inc 300 Park Av Newark N J
...Vermix Air-motor Agitators. Model Types A, AB, AL, B, ...D, F, FD.

...ICK-CLOSING VALVES

Quick-closing lever gate valves are designed for use ...flammable liquid systems. They are approved for ...allation in supply lines containing gasoline, naphtha, ...hol, and similar liquids at working pressures up to ...psi and fuel and lubricating oils at working pressures ...to 150 psi.

Two types of valves are available; one self-closing ...d the other manual-closing.

From a fire protection standpoint, it is preferable to ...e the self-closing type at the discharge end of a ...mmable liquids line. This valve cannot be left in an ...n position as it is manually opened against a strong ...g which closes the gate on release of the lever.

...Williams Valves Detroit Controls Div American Radiator & ...dard Sanitary Corp Great Meadows Rd Stratford Conn
...Quik-Flo Lever Gate Valve. Fig. 835. ¾ to 3 in. Self closing.
...Quik-Flo Lever Gate Valve. Fig. 736. ¾ to 3 in. Manual ...se.

...EVEL-LIMIT SWITCHES

...Approved level-limit switches are so designed that ...ey do not provide an ignition source for the material ...hose level is being monitored.

The Instruments, Inc. switches are intended to monitor a predetermined level in liquids or semi-solids. The equipment consists of a probe which normally extends into the associated container, a control unit and a length of connecting cable.

The Lumenite switches are float-actuated and are suitable for liquid service only; again, the equipment consists of a tank unit (float assembly), a control and connecting cable the length of which is not critical.

The equipment does not measure depth, but high or low level limits are detected electronically with resulting lamp indication and switch action. The contacts on the switch are available to operate associated equipment.

Instruments Inc 3102 Sand Springs Rd Tulsa Okla
Electr-O-Probe Control Model B-04-FS with Probe Model B-04-08. Control and probe are interconnected by special coaxial cable up to 100-ft long. Operates at nominal 117v, 60 c supply. Contact rating 10 amp 110v.
Electr-O-Probe. Model B-06-FS. Operates at nominal 115v, 60 c supply. Contact rating 10 amp 110v.

Lumenite Electronic Co 467 S Dearborn St Chicago 5 Ill
Control Models FN-1011, -A, -A1, -A2, FN-1012, -A, -A1, -A2. Used with Tank Units EH-130, EH-185.

Aeronautical and Instruments Div Robertshaw-Fulton Controls Co Santa Ana Freeway at Euclid Av Anaheim Cal
Level-Tek Fixed Level Control System. Consists of Control 101-B, 101-W, 102-B, 102-W, 1010-E or 1020-E; probe 705 or 706; connecting cable 712, 713, or 714. Operates at nominal 117v a-c. Contacts rated 10/5 amps, non-inductive at 125/250v a-c.

EMERGENCY SHUTOFF VALVES

Emergency shutoff valves are normally open valves arranged to close automatically in the event of abnormal pipe-line or other plant conditions or excess valve temperature; certain models may be closed electrically from a remote station.

They are intended for service in pipe lines handling flammable gases or liquids compatible with internal materials; consequently, in ordering, the fluid handled, its temperature and pressure should be specified in addition to pipe size.

Flow direction is important; also, the Coppus equipment must be installed in a horizontal pipe line with the operator up. The Valco equipment will function in any position but, being heat-actuated, its installed location is important for prompt operation.

See also Gas Safety Shutoff Valves and Oil Safety Shutoff Valves.

Coppus Engineering Corp 344 Park Av Worcester Mass
Excess-flow-type Shutoff Valve. Model 1200. 1¼, 2, 3, 4, 6, 8 in. 55–1000 gpm trip-point range depending on orifice used and fluid handled. Working pressures to 300 psi depending on valve material. Special equipment available for higher pressures.
Pressure-type Shutoff Valves. Models 1500H (high pressure), 1500L (low pressure). 1¼, 2, 3, 4, 6, 8 in. For normal-line pressures of from 10 in. we to 100 psi with trip points 5 in. we to 50 psi above or below normal.
Electric-type Shutoff Valves. Models 1700 (closes when de-

energised), 1800 (closes when energized). Manual reset. 1½, 2, 3, 4, 6, 8 in. 115 or 230v a-c or d-c available. Working pressures to 300 psi depending on valve material. Special equipment available for higher pressures.

Cast or stainless-steel valve bodies are preferable for flammable-liquid service and should be specified in ordering. Bronze bodies larger than 2 in. are not recommended for such service.

Valco Inc 1410 West Av Cincinnati 15 O

Heat-actuated Shutoff Valve. Model U-1-45. ¼, ¾, 1, 1¼, 1½, 2 in. 20 psi max. Held open against spring by approved automatic sprinkler head (usually Star).

SAFETY CONTAINERS

When small amounts of flammable liquids are used in open containers, they can readily be exposed to ignition sources, careless handling, or accidental spillage. To minimize this severe hazard, safety cans and specially designed containers are necessary when transporting, dispensing, or handling flammable liquid.

SAFETY CANS

Safety cans have pouring outlets equipped with tight-fitting caps or valves, normally closed by spring action, except when held open by hand. This prevents spillage if the can is tipped over or exposed to fire.

Safety cans of more than one-gallon capacity, when used for solvents and thinners, should have a flash arresting screen at the outlet and fill connections. Such screens prevent external fire from igniting vapors in the can while liquid is being poured. The screens may be omitted when the cans contain viscous liquids such as rubber cement.

Agate Sheet Metal Products Co 1920 S Western Av Chicago 8 Ill

Agate. 5010G (1 qt), 5011G (2 qt), 5012G (1 gal), 5013G (2 gal), 5114G (3 gal), 5115G (5 gal).

Eagle Mfg Co Wellsburg W Va

Eagle. Models UI-2 (1 qt), UI-4 (½ gal), UI-10S (1 gal), UI-25S (2½ gal), UI-50S (5 gal). Suffix F added indicates pour-funnel.

Justrite Mfg Co 2061 N Southport Av Chicago 14 Ill

Justrite. Cat Nos. 10000 (1 pt), 10100 (1 qt), 10200 (2 qt), 10301 (1 gal), 10401 (1 Imp gal), 10501 (2 gal), 10701 (3 gal), 10801 (5 gal), 10901 (5 Imp gal).

Justrite Laboratory Can. Cat Nos. 10809, 10849 (Hot-tin-dipped). 5 gal. With self-closing faucet.

Justrite Stainless Steel Cans. Cat Nos. 10263 (½ gal), 10363 (1 gal), 10863 (5 gal).

Justrite (Hot-tin-dipped). Cat Nos. 10141 (1 qt), 10241 (½ gal), 10341 (1 gal), 10541 (2 gal), 10741 (3 gal), 10841 (5 gal)

Miller-Peerless Mfg Co 452 N Sangamon St Chicago Ill

Peerless. 1 pt, 1, 2 qt, 1, 2, 3, 5 gal.

Protectoseal Co 1920 S Western Av Chicago 8 Ill

Protectoseal Safety Can. Cat Nos. 4609A (1 pt), 4610A (1 qt), 4611A (2 qt), 4612 (1 gal), 4613 (2 gal), 4614 (3 gal), 4615 (5 gal). Letter D before model numbers indicates stainless-steel type 302, letter F stainless-steel type 316, letter G monel, letter T hot-tin-dipped.

Protectoseal Laboratory Can. Cat Nos. 8824 (terneplate), M882A (monel), S882A (stainless), with pouring vent tube, no flame arresting screen. Cat Nos. 883A (terneplate), M883A (monel), S883A (stainless), with flame-arresting screen but no pouring vent tube. 1 gal. Oval base.

Protectoseal Laboratory Can with Tilt Frame. Cat No. 5 gal. Manufacturer can also supply wall racks for supporting either one or two cans.

Safety Supply Co 214 King St E Toronto 2 Ont

Agate. 5010G (1 qt), 5011G (2 qt), 5012G (1 gal), 5013G (2 gal), 5114G (3 gal), 5115G (5 gal).

Protectoseal Safety Can. Cat Nos. 4609A (1 pt), 4610A (1 qt), 4611A (2 qt), 4612 (1 gal), 4613 (2 gal), 4614 (3 gal), 4615 (5 gal). Letter D before model numbers indicates stainless-steel type 302, letter F stainless-steel type 316, letter G monel, letter T hot-tin-dipped.

Protectoseal Laboratory Can. Cat Nos. 8824 (terneplate), M882A (monel), S882A (stainless), with pouring vent tube, no flame arresting screen. Cat Nos. 883A (terneplate), M883A (monel), S883A (stainless), with flame-arresting screen but no pouring vent tube. 1 gal. Oval base.

Protectoseal Laboratory Can with Tilt Frame. Cat No. 5 gal. Manufacturer can also supply wall racks for supporting either one or two cans.

SAFETY CANS for Viscous Liquids

Agate Sheet Metal Products Co 1920 S Western Av Chicago 8 Ill

Agate. Cat Nos. 5010 (1 qt), 5011 (2 qt), 5012 (1 gal), 5013 (2 gal), 5114 (3 gal), 5115 (5 gal).

Eagle Mfg Co Wellsburg W Va

Eagle. Models UI-2 (1 qt), UI-4 (½ gal), UI-10 (1 gal), UI-25 (2½ gal), UI-50 (5 gal). Suffix F added indicates pour-funnel.

Justrite Mfg Co 2061 N Southport Av Chicago 14 Ill

Justrite. Cat Nos. 10000 (1 pt), 10100 (1 qt), 10200 (2 qt), 10300 (1 gal), 10400 (1 Imp gal), 10500 (2 gal), 10700 (3 gal), 10800 (5 gal), 10900 (5 Imp gal).

Justrite Stainless Steel Cans. Cat Nos. 10262 (½ gal), 10362 (1 gal), 10862 (5 gal).

Miller-Peerless Mfg Co 452 N Sangamon St Chicago Ill

Peerless. 1 pt, 1, 2 qt, 1, 2, 3, 5 gal.

Protectoseal Co 1920 S Western Av Chicago 8 Ill

Protectoseal. Model Nos. 886A (½ gal), 887A (1 gal).

Safety Supply Co 214 King St E Toronto 2 Ont

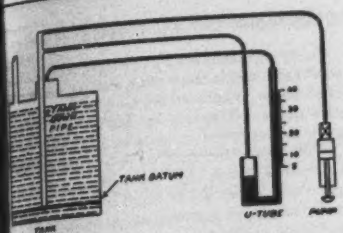
Agate. Cat Nos. 5010 (1 qt), 5011 (2 qt), 5012 (1 gal), 5013 (2 gal), 5114 (3 gal), 5115 (5 gal).

Protectoseal. Model Nos. 886A (½ gal), 887A (1 gal).

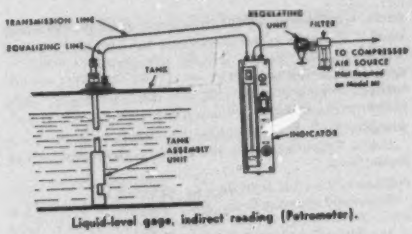
FILLING & SUPPLY CANS

These cans are used for carrying flammable liquids from drums or pumps, for filling other safety cans, or for keeping a small supply on hand at benches or machines.

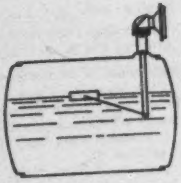
Liquids should be transferred from the original container or drum to the safety can in a cut-off area away from the main drum storage or combustibles. The best method of transfer is by means of manually operated drum pumps or portable pump tanks. With this equip-



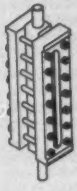
Liquid-level gage, indirect reading (King).



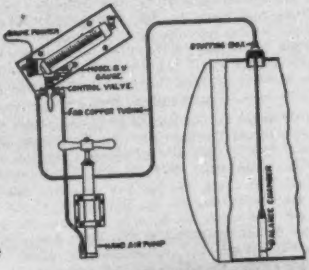
Liquid-level gage, indirect reading (Petrometer).



Liquid-level gage, indirect reading (Liquidometer).

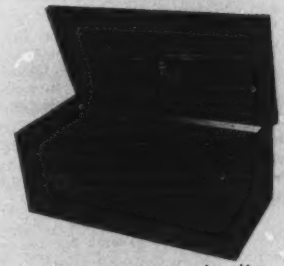


Liquid-level gage, direct reading.

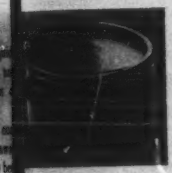


Liquid-level gage, remote reading (Pneumercator).

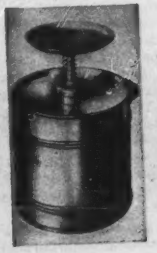
Safety cans.



Cleaning tank, washing.



Drip can.



Plunger can.

Bench can.

Filling and supply can.

ment, liquid cannot flow out except through the pump itself. The only other acceptable method is the use of self-closing faucets or valves on the drums.

Eagle Mfg Co Wellsburg W Va
Eagle. Models U2-26-S (2½ gal), U2-51-S (5 gal). With flexible spout.

Justrite Mfg Co 2061 N Southport Av Chicago 14 Ill
Justrite Filling Cans. Nos. 10721 (2 gal), 10821 (5 gal). With flexible spout.

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Dispenser Cans. Nos. 245 D (1 gal, 5/16-in. flexible hose), 245E (1 gal, 9/16-in. flexible hose). No. 247-F Series (3 gal, flexible hose, ⅜, ⅜, 1-in. opening). No. 247-R Series (3 gal, rigid spout, ⅜, ⅜, 1-in. opening). No. 249-F Series (5 gal, flexible hose, ⅜, ⅜, 1-in. opening). No. 249-R Series (5 gal, rigid spout, ⅜, ⅜, 1-in. opening). No. 8410A (1 gal, ¼-in. flexible hose). No. 8410B (1 gal, 7/16-in. flexible hose). No. 8420A (2 gal, ¼-in. flexible hose). No. 8420B (2 gal, 7/16-in. flexible hose). No. 8455 (5 gal, ¼-in. swivel spout).

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Dispenser Cans. Nos. 245 D (1 gal, 5/16-in. flexible hose), 245E (1 gal, 9/16-in. flexible hose). No. 247-F Series (3 gal, flexible hose, ⅜, ⅜, 1-in. opening). No. 247-R Series (3 gal, rigid spout, ⅜, ⅜, 1-in. opening). No. 249-F Series (5 gal, flexible hose, ⅜, ⅜, 1-in. opening). No. 249-R Series (5 gal, rigid spout, ⅜, ⅜, 1-in. opening). No. 8410A (1 gal, ¼-in. flexible hose). No. 8410B (1 gal, 7/16-in. flexible hose). No. 8420A (2 gal, ¼-in. flexible hose). No. 8420B (2 gal, 7/16-in. flexible hose). No. 8455 (5 gal, ¼-in. swivel spout).

PLUNGER CANS

Plunger cans are designed for bench or machine work where it is necessary to moisten a sponge or swab with volatile flammable liquids. When the top and piston are depressed, liquid is forced up through the hollow plunger and moistens the screen in the concave receiving pan. The pan and screen are made in various sizes depending on the quantity of liquid desired. Sizes range from 1 pt. to 2 gal.

Plunger cans eliminate the hazard of open pans of flammable liquids on work benches or machines, and they also reduce evaporation loss.

Eagle Mfg Co Wellsburg W Va
Eagle Plunger Cans. Models P-701 (1 qt), P-702 (2 qt), P-704 (4 qt).

Justrite Mfg Co 2061 N Southport Av Chicago 14 Ill
Justrite Plunger Cans. Cat Nos. 10108 (1 qt), 10208 (½ gal), 10308 (1 gal).

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Plunger Cans. Cat Nos. 236-A (1 pt, 1-in. dasher), 236-B (1 pt, 2-in. dasher), 237-A (1 qt, 1-in. dasher), 237-B (1 qt, 2-in. dasher), 237-C (1 qt, 3-in. dasher), 241-A (2 qt), 242 (1 gal), 243 (2 gal).

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Plunger Cans. Cat Nos. 236-A (1 pt, 1-in. dasher), 236-B (1 pt, 2-in. dasher), 237-A (1 qt, 1-in. dasher), 237-B (1 qt, 2-in. dasher), 237-C (1 qt, 3-in. dasher), 241-A (2 qt), 242 (1 gal), 243 (2 gal).

CLEANING TANKS, Dipping, Washing

Safety dip tanks are recommended where flammable liquids are used in the coating, cleaning, and dipping of small parts. Approved dip tanks may be obtained in sizes up to 2-ft square and are equipped with automatic-closing covers actuated by fusible links.

Wash tanks are more convenient than perforated screen-type bench cans for washing small parts in quantities. They are available in sizes up to 14½ in diameter, and in square or rectangular shape. The perforated basket containing the parts is lowered into the liquid and moved about for a short time. After washing, the basket is lifted up onto brackets in the can and allowed to drain. They are suitable also for dipping with the basket removed. A fusible link arrangement will close the cover automatically to snuff out fire in the container.

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Dip Tanks. Nos. 284A (3 pt), 1423A (1 pt), 1423E (2 gal), 1425E (3½ gal), 1426E (5 gal), 271 (6 gal), 1448E (8 gal), 272 (12½ gal), 1448E with brush rack.
Protectoseal Wash Cans. Cat Nos. 212 (3½ gal Type A), 213 (7 gal Type B).
Protectoseal Wash Tanks. Cat Nos. 1413E (1 gal), 1415F (2 gal), 1416E (3½ gal), 1418E (6 gal), with removable basket and self-closing cover.
Protectoseal Wash Tank. Model 1438E. With drainboard, removable basket, self-closing cover.
Protectoseal Wash Tanks. Nos. 277A (8 gal), 279A (25 gal). Full capacity 11 gal. Stand waist-high. Gravity-closure cover operated by foot treadle.
Protectoseal Automatic Mask Washer. No. 761E. With self-closing cover.
Protectoseal Spray Gun Holders. Nos. 1331 (1 gun), 1332 (2 gun), 1334 (4 gun).
Protectoseal Spray Gun Container. Model No. 1360. With removable basket and self-closing cover.
Protectoseal Air-Matic Parts Washers. Nos. 756G (6 gal), 770 (10 gal). With removable basket, pneumatic oscillator and self-closing cover.

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Dip Tanks. Nos. 284A (3 pt), 1423A (1 pt), 1423E (2 gal), 1425E (3½ gal), 1426E (5 gal), 271 (8 gal), 1448E (8 gal), 272 (12½ gal), 1448E with brush rack.
Protectoseal Wash Cans. Cat Nos. 212 (3½ gal Type A), 213 (7 gal Type B).
Protectoseal Wash Tanks. Cat Nos. 1413E (1 gal), 1415F (2 gal), 1416E (3½ gal), 1418E (6 gal), with removable basket and self-closing cover.
Protectoseal Wash Tank. Model 1438E. With drainboard, removable basket, self-closing cover.
Protectoseal Wash Tanks. Nos. 277A (8 gal), 279A (25 gal). Full capacity 11 gal. Stands waist-high. Gravity-closure cover operated by foot treadle.
Protectoseal Automatic Mask Washer. No. 761E. With self-closing cover.
Protectoseal Spray Gun Holders. Nos. 1331 (1 gun), 1332 (2 gun), 1334 (4 gun).
Protectoseal Spray Gun Container. Model No. 1360. With removable basket and self-closing cover.
Protectoseal Air-Matic Parts Washer. Nos. 756G (6 gal),

(10 gal). With removable basket, pneumatic oscillator and closing cover.

SWABBING CANS

Swabbing cans are a combination of a bench can and safety-can reservoir connected by brass tubing in which a needle valve regulates the rate of flow.

Protectosal Co 1920 S Western Av Chicago 8 Ill
Protectosal Swabbing Can. Cat Nos. 211A (1 gal reservoir), (5 gal reservoir).
Protectosal Swab Pail. Models 1318A, 1318B (with hinged cover). 1½ gal.

Safety Supply Co 214 King St E Toronto 2 Ont
Protectosal Swabbing Can. Cat Nos. 211A (1 gal reservoir), (5 gal reservoir).
Protectosal Swab Pail. Models 1318A, 1318B (with hinged cover). 1½ gal.

BENCH CANS

Approved safety bench cans should be used for cleaning operations such as cleaning metal parts. The material to be cleaned is placed on a perforated metal screen which is held above the liquid surface by a spring in the container. After immersing the parts by depressing the pan it is allowed to rise upon release of the spring which permits the parts to drain. Although the top is not self-closing, a fire in the container can be quickly snuffed out by manually closing the cover.

Eagle Mfg Co Wellsburg W Va
Eagle Bench Can. Cat Nos. B-601 (1 qt), B-602 (2 qt), B-604 (4 qt), B-606-NL (6 qt), B-608 (8 qt).

Electric Mfg Co 2061 N Southport Av Chicago Ill
Electric Bench Can. Model 10370. 1 gal.

Protectosal Co 1920 S Western Av Chicago 8 Ill
Protectosal Bench Can. Cat Nos. 223A (1 qt), 218 (2 qt), 220 (3 gal), 224 (5 gal).
Protectosal Machine Bench Can. Cat No. 5408. 2 gal. With two supporting straps for mounting securely to side of a machine bench.
Protectosal Touch-up Can. Cat No. 228A. ½ pt.
Protectosal Bench Parts Washers. Cat Nos. 3218 (3 pt), 3222 (3 gal). With portable parts basket.

Safety Supply Co 214 King St E Toronto 2 Ont
Protectosal Bench Can. Cat Nos. 223A (1 qt), 218 (2 qt), 220 (3 gal), 224 (5 gal).
Protectosal Machine Bench Can. Cat No. 5408. 2 gal. With two supporting straps for mounting securely to side of a machine bench.
Protectosal Touch-up Can. Cat No. 228A. ½ pt.
Protectosal Bench Parts Washers. Cat Nos. 3218 (3 pt), 3222 (3 gal). With portable parts basket.

DRAIN, DRIP, & DISPOSAL CANS

Drain cans are used in draining volatile and flammable liquids from drums or other containers. Drip cans are placed under drum faucets to catch spillage and drippage during dispensing of flammable liquids. Disposal cans are used to dispose of flammable or corrosive liquids safely.

Eagle Mfg Co Wellsburg W Va
Eagle Drain Can. Model DN-908.
Eagle Drip Can. Model DP-802.

Protectosal Co 1920 S Western Av Chicago 8 Ill
Protectosal Drain Can. Model 1316.
Protectosal Drip Can. Model 1322.
Protectosal Disposal Can. Models 5002 (stainless steel, 2 gal), 5002A (terneplate, 2 gal), 5005 (stainless steel, 5 gal), 5005A (terneplate, 5 gal).

Safety Supply Co 214 King St E Toronto 2 Ont
Protectosal Drain Can. Model 1316.
Protectosal Drip Can. Model 1322.
Protectosal Disposal Can. Models 5002 (stainless steel, 2 gal), 5002A (terneplate, 2 gal), 5005 (stainless steel, 5 gal), 5005A (terneplate, 5 gal).

WATER-WASH SPRAY BOOTHS

Water-wash spray booths are power-ventilated structures provided to accommodate spraying operations. They are designed to confine vapors and overspray and to conduct or direct vapors to an exhaust system for safe removal outside the building. The exhaust air is drawn through a water curtain to remove overspray.

Binks Mfg Co 3114-40 Carroll Av Chicago Ill
Water-wash Spray Booths. Models WB, CWB, PB, CPB.

DeVilbiss Co 300 Phillips Av Toledo 1 O
Water-wash Spray Booth. Type XNE. Nozzle type.
Water-wash Spray Booth. Type XNC. Centrifugal type.

M & E Mfg Co 2571 Winthrop Av Indianapolis 5 Ind
Water-wash Spray Booths. Models SW, SWC, SWB, SWBC, EW, EWC, EWB, EWBC, CW, CWC, BW, BWC.

Paasche Airbrush Co 1909-23 Diversey Pkwy Chicago 14 Ill
Water-wash Spray Booths. Types W1, W2, W3, W4.

Spray Engineering Co 100 Cambridge St Burlington Mass
Spraco Nozzle-box Water-wash Spray Booth.

Westfield Sheet Metal Works Inc Monroe Av & Eighth St Kenilworth N J
Water-wash Spray Booth. Model W.

TIRE SPRAY MACHINE

Tire spray-machines are specialty spray booths designed to accommodate the spraying of rubber cement on tires. They are equipped with approved dry filters to confine the overspray. Explosionproof motors are used to drive the exhaust fan and rotate the tire. Automatic sprinkler protection is included.

Boylston Rubber & Chemical Corp Cambridge 41 Mass
Boylston Safe-T-Spray. Tire Spraying Unit. Models 2500R, 2500L.

SPRAY-MATERIAL CONTAINERS

Spray-material containers are pressure vessels used to hold the supply of finishing material. They are available with or without agitators.

Binks Manufacturing Co 3114-40 Carroll Av Chicago Ill
Pressure material containers. Series D-5500, D-5400, D-5300, D-5200, D-5100, D-5000. With hand operated or air-motor type agitators only.

DeVilbiss Co 300 Phillips Av Toledo 1 O
Pressure material container. Type QM.

Eclipse Air Brush Co Inc 300 Park Av Newark 7 N J
Pressure material containers. Types HLH (5 gal) and HLA (12 gal).

Paasche Airbrush Co 1909-23 Diversey Pkwy Chicago 14 Ill
Pressure material containers. Types F613, F530, F551. With hand operated or air-motor type agitators only.

Spray Engineering Co 100 Cambridge St Burlington Mass
Pressure material containers. Types P, Q, S (without agitator or with hand operated agitator). Types AGP, AGQ, AGS (with air-motor driven agitator).

OVERSPRAY COLLECTORS

Dry-type overspray collectors are filter pads used to reduce residue accumulation in exhaust ducts and stacks of dry-type booths. Although approved pads are of fire-retardant material, when coated with overspray deposits they should be considered similar to oily waste. Daily or more frequent replacement may be required, depending on application.

Research Products Corp 1015 E Washington Av Madison 20 Wis
RP Paint Arresters. Stock No. 3032. With grid, frames, hinges, and other accessories. 20x20x1 in.

KITCHEN EXHAUST FANS

Approved fans for commercial kitchen-range exhaust systems are designed to remove grease vapors effectively and to provide a fire barrier. Automatic sprinkler protection is needed in range hoods and in ductwork between hood and fan. The approved fan prevents grease accumulation in the ductwork beyond the fan and also serves as an automatic fire barrier. It thus eliminates the need for automatic sprinklers in the ductwork beyond the fan.

American Air Filter Co Inc 215 Central Av Louisville 8 Ky
Type W Roto-Clone, Arrangement A. Size Nos. 8, 10, 12, 14, 16, 20, 24, 27, 30, 33, 36, 45.

SPRAY-BOOTH VENTILATING FANS

Approved fan-motor units for direct drive arranged so that the motor is not in the path of flammable vapors or dusts. Where belt drive is used an air-tight belt passage is provided inside the duct.

American Machine & Metals Inc DeBothezat Fans Div East Ill
Bifurcator Ventilator. 8 to 36 in.

Binks Mfg Co 3114-40 Carroll Av Chicago Ill
Model 30.

DeVilbiss Co 300 Phillips Av Toledo 1 O
Types JF, JH, JJ, JK, JL.

Eclipse Air Brush Co Inc 300 Park Av Newark 7 N J
Types AA, BB.

Hartzell Propeller Fan Co Piqua O
Cat Nos. N-E, N-BD, D-BD, VA.

M & E Mfg Co 2571 Winthrop Av Indianapolis 5 Ind
Types M, DM, DMD.

Paasche Airbrush Co 1909-23 Diversey Pkwy Chicago 14 Ill
Types B, BE.

Propellair Div of Robbins & Myers Inc Springfield O
Types BT, BTV, CE, CS, CSV, VCS.

Spray Engineering Co 100 Cambridge St Burlington Mass
Spraco. Model 895A. 16 in.
Spraco. Model 896A. 24 in.

TORCHES & FORGES, Portable, Oil-fired

Approved portable fuel-oil burning torches and forges are intended for general utility and maintenance service. These torches or forges are of the suction type and avoid the fire hazard of leaks from fuel tanks pressured by compressed air.

The oil tanks are of heavy steel construction and equipped with flame arrester in the fill connection. Oil is drawn into the nozzle through a suction pipe by vacuum created by a compressed air jet in a Venturi inspirator. Air pressures of 50 to 100 psi and light grade fuel oils are used.

Hauck Mfg Co 124-36 Tenth St Brooklyn N Y
Handi-Oil Forges. Nos. 376, 378.
Hauck Rivet Forges. Nos. 362, 366, 368, 370, 373, 375, 376, 378.
Hauck Venturi Suction Torch Equipments. Nos. 648 through 654.
Hauck Forges. Nos. 516, 517, 518.

SAFETY TOOLS

Tools of aluminum-bronze, or beryllium-copper alloy are sometimes advised in hazardous areas containing flammable gases or liquids such as alcohol, benzene, or gasoline, to lessen the chance of ignition of vapors by mechanical sparks. These tools may emit some spark

Spray-booth ventilating fans.

Safety tools.

Spray booth, water wash.

Torch, portable, oil fired.

Forge, portable, oil fired.

striking metal, but the sparks have a low heat content compared with ordinary steel and are unlikely to ite most flammable liquids. Special care is needed 's carbon disulphide which has an extremely low ition point. With good maintenance the tools will ve reasonable service.

pco Metal Inc 1745 S 38th St Milwaukee Wis
Ampco Nonsparking Safety Tools.

ryllium Corp Reading Pa
Beryco Safety Tools.

fety Supply Co 214 King St E Toronto 2 Ont
Ampco Nonsparking Safety Tools.

HYDRAULIC FLUIDS

Hydraulic fluids less hazardous than the commonly used flammable mineral oils are now on the market. They are often referred to incorrectly as nonflammable. All presently available fluids will burn under certain conditions. Fluids approved and listed here have been tested to evaluate fire hazard only. In each case the fire hazard has been reduced to an acceptable degree, meeting the approval standards of the Factory Mutuals.

It is recommended that, when a plant considers converting to a less hazardous hydraulic fluid, the fluid manufacturers be requested to supply data relative to

field experience under the operating conditions to be encountered in the insured plant.

There are three groups of less hazardous hydraulic fluids and each differs in composition.

Group I — In this group are the water-glycol fluids with other additives. They do not generally attack ordinary packings and seals used in pumps and valves. A loss of water content in normal use through evaporation is reflected in a rise in the viscosity of the fluid and consequent improper functioning of the hydraulic equipment. This serves as a "built-in" safeguard in that pumping equipment becomes inoperative before the fire hazard of the material is altered by the decrease in water content.

E F Houghton & Co 303 W Lehigh Av Philadelphia 33 Pa
Houghto-Safe Nos. 620, 620-B, 620-R.
Houghto-Safe Nos. 625, 625-R.

Pennsoil Co 1630 W Olympic Blvd Los Angeles 15 Cal
Pennsoil Hydraulic Fluid FR.

Henry E Sauson and Sons Inc 2215-25 N American St Philadelphia 33 Pa
Hydra-Safe No. 620.
Hydra-Safe No. 625.

Socony Mobil Oil Co Inc 150 E 42nd St New York 17 N Y
Mobil Nyvac No. 20.
Mobil Nyvac No. 30.

Union Carbide Chemicals Co Div of Union Carbide Corp 30 E 42nd St New York 17 N Y
Ucon Hydrolube 150-CP.
Ucon Hydrolube 275-CP.
Ucon Hydrolube 300-N.

Group III — In this group are the synthetic fluids, including phosphate-ester and phosphate-ester base, and halogenated hydrocarbon base fluids. These are stable homogeneous compounds whose characteristics do not change appreciably throughout their operational life. Regular pump seals, packings and gaskets may be affected by these fluids and should be replaced by material that will not be affected. Suppliers of these can be obtained from the listed manufacturers.

Celanese Corp of America 180 Madison Av New York 16 N Y
Cellulube 150.
Cellulube 220.

E F Houghton & Co 303 W Lehigh Av Philadelphia 33 Pa
Houghto-Safe 1120.

Monsanto Chemical Co Organic Chemicals Div 800 Lindbergh Blvd St Louis 66 Mo
Pydraul A-200.
Pydraul F-9.
Pydraul 625.

Shell Oil Co One Rockefeller Plaza New York 20 N Y
Shell SFR Fluid B.
Shell SFR Fluid C.

Socony Mobil Oil Co Inc 150 E 42nd St New York 17 N Y
Mobil Pyrogard 43.
Mobil Pyrogard 53.
Mobil Pyrogard 55.

Group III — In this group are the water-oil emul
When performing under ideal conditions, the
hazard of these materials is considerably less than
of straight mineral oil. However, due to the
of the material, the stability of the emulsion
carefully watched. Oil separation may be caus
contamination of the fluid by chemical cleaner
solvents, temperatures above 150°F. or below
high pressure (1500–2000 psi), and long idle pe
such as in drum storage or during shutdown of
ment. Maintenance of the water content and
supervision than of the other two groups is requi
insure adequate fire protection. Strict adheren
the manufacturer's instructions including the
mixing is of the utmost importance.

There are no approved liquids in this group
present time.

SAFETY SOLVENTS

Flash points of the following commercially avail
safety solvents have been confirmed by tests at the
ratories of the Factory Mutual Engineering Div
Safety solvents by definition are those which have
points of 100°F. (Cleveland open cup) or above,
should be used wherever possible in place of low-
point solvents. In ordering safety solvents, it is a
vantage to know that the flash point has been determ
by an independent testing laboratory.

This listing is for information only and does
confer approval or acceptance in the ordinary sens
applied to devices and equipment listed in this ma

Brulin & Co Inc 2930-45 Columbia Av Indianapolis 7 Ind
Solvent Degreaser. Flash point 205°F. Fire point 225°F.
Safety-Solv, Formula 512M. Flash point 173°F. Fire p
185°F.
Formula 815MX. No flash up to the boiling point.

Fire Organics Inc 205 Main St Lodi N J
FO-128. Flash point 180°F. Fire point 190°F.

John B Moore Corp Peerless Bldg Box 3 Nutley 10 N J
M-1 (Orthosene). Flash point 160°F. Fire point 165°F.
M-2 (Per-Trolene). Flash point 140°F. Fire point 180°F.
M-3 (Frigisol). Flash point 225°F. Fire point 230°F.
M-4 (Metricolene). Flash point 190°F. Fire point 205°F.
M-17 (Furfasol). No flash up to the boiling point.
MP-10. Flash point 135°F. Fire point 140°F.

Octagon Process Inc 596 River Rd Edgewater N J
Klearall 95. Flash point 140°F. Fire point 170°F.
Klearall 120. Flash point 145°F. Fire point 150°F.

G H Packwood Mfg Co 1545 Tower Grove Av St. Louis 10 M
PAX Machinery Cleaner-liquid Concentrate. No flash up
the boiling point.
PAX 1011 Cleaning Compound. No flash up to the boiling po

...r Mfg Co 3053 E 87th St Cleveland 4 O
...ve Grease Remover. No flash up to the boiling point.

...SHING MATERIALS

...d vehicles are available which cannot be ...d in spray form or as a residue until dry. Finish- ...materials of this type have been tested by the ...ory Mutual Engineering Division to evaluate the ...azard and have been approved and listed as less ...ardous.

American Cyanamid Co 30 Rockefeller Plaza New York 20 N Y
Melaqua 600 Clear Resin.
Phthalo Blue Baking Enamel No. 466.
Phthalo Green Baking Enamel No. 469.
Maroon Baking Enamel No. 470.
Scarlet Baking Enamel No. 471.
Yellow Iron Oxide Enamel No. 472.
Red Iron Oxide Baking Enamel No. 473.
Metallescent Maroon Baking Enamel No. 475.
Metallescent Gold Baking Enamel No. 476.
Metallescent Bright Red Enamel No. 477.
Metallescent Red Iron Oxide Enamel No. 478.
Metallescent Green Baking Enamel No. 479.
Metallescent Blue Baking Enamel No. 480.
White Baking Enamel No. 483.
High Gloss Black Baking Enamel No. 487.

FLAMMABLE-GAS EQUIPMENT

LP-GAS SYSTEMS

In the gaseous state, LP-gases such as propane and butane have the same general hazards as any other flammable gas except that they are heavier than air. Therefore precautions must be taken to prevent LP-gases settling in low places and special arrangements are needed for ventilation.

In the liquid state, LP-gas is an extremely volatile flammable liquid and exerts high pressures in containers. In the event of container failure, expansive energy is released similar to a steam boiler explosion.

LP-gases for industrial use are shipped in the liquid state under pressure in special insulated tank cars and tank trucks equipped with the necessary safety devices. Industrial storage is in the liquid state under pressure in tanks designed and fabricated in accordance with recognized codes. These tanks have relief valves and excess flow valves.

Fire experience has shown that tanks may rupture and rocket with disastrous consequences if severe fire exposure heats and softens the tank metal. Consequently, special protection against such heating or extra separation from buildings is recommended under certain conditions. Special tank protection consists of burying or mounding, insulating, or providing automatic fixed water spray protection.

At low temperatures or high rates of use, LP-gases require external heat to accelerate vaporization. A vaporizer, using low pressure steam or hot water is located outdoors or in a small outside enclosure. Relief valves are provided.

Small portable cylinders are sometimes used in industrial plants. These cylinders are protected with fusible plugs and/or relief valves to relieve excessive pressures. Such cylinders should be installed outside buildings in locations where they will not be subject to ignition sources or mechanical damage, and at distances from building openings as recommended by the Factory Mutual Engineering Division. These cylinders are connected to the gas piping through a regulating valve.

LP-GAS SYSTEMS, Industrial Installations

A plot plan showing the location of the storage tanks, unloading stations, vaporizers and diluting equipment in relation to plant buildings should be submitted by the installer to the Factory Mutual Engineering Division before the installation is made. The installer should also submit drawings showing equipment, piping, controls, and flow diagrams, any special tank protection.

Phillips Petroleum Co Sales Department Bartlesville Okla
Philgas Industrial Propane and Butane Systems.

LP-GAS VAPORIZERS

The vaporizers are for outdoor use and are designed to vaporize LP-gases by direct-fired burners located under the vaporizing chambers. Rate of vaporization is automatically controlled to supply the demand of consuming devices with burner control provided by a thermostatic element installed in the vaporizing chamber. The vaporizer design incorporates a special relief arrangement which allows storage tank vapor to supplement vaporizer product on heavy demand. To prevent liquid carry-over on excessive load, the vaporizer design incorporates an antiflood valve arrangement.

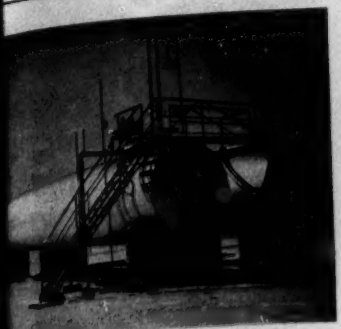
For proper vaporizer operation, the maximum distance between the LP-gas storage tank and the vaporizer is 30 ft if the vaporizer capacity is 30 gph and 40 ft if capacity is 70 gph. However, it is important to note that from the fire protection standpoint, the vaporizer should be located as far as practical from the LP-gas storage tank. The vaporizer should be at least 75 ft from the tank relief valve and at least 15 ft from any part of the tank.

If compliance with the fire protection recommendations requires the vaporizer to be further than 30 ft or 40 ft as applicable, from the tank, the vaporizer manufacturer must be consulted. Further, it is recommended that the manufacturer always be advised of the proposed installation when ordering a vaporizer so that the connecting piping, associated fittings, etc. may be economically but properly sized.

American Liquid Gas Corp 1109 Santa Fe Av Los Angeles Calif
Models Algas 40-V, 80-V, 120-V, 160-V, 200-V, 320-V, 400-V, 800-V. Designation indicates rated vaporizing capacity, gph. Vapor delivery at constant pressure usually 15-30 psi range.

John E. Mitchell Co Dallas Tex
Model Nos. 30, 70. Designation indicates rated vaporizing capacity, gph.

Ransome Torch & Burner Co 4030 Hollis St Emeryville Calif
Model Nos. RV40, RV80, RV100, RV120. Designation indicates rated vaporizing capacity, gph.



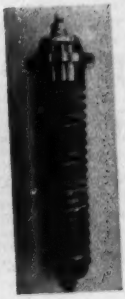
LP-gas system, storage tank, industrial.

LP-gas vaporizer, direct fired.

LP-gas vaporizer-riser.

LP-gas vaporizer, steam heated.

Relief valves, LP-gas.



Furnace, portable, LP-gas fired.

LP-GAS VAPORIZER-MIXERS

These machines are for outdoor service, do not require electric power and are designed to vaporize liquid LP-gas, mix the vapor with inspirated air to supply, within set pressures, a vapor-air mixture of predetermined Btu/cu ft value to a plant piping system. The operation is accomplished by the action of two machine functions consisting of a direct gas-fired vaporiser and a vapor-air mixing section which operate to satisfy the system demand. The mixer section cycles "on-off" to maintain the supply of proper vapor-air mixture to the system while the vaporizer section operates "on-off" to maintain an adequate vapor supply to the mixer section. The gas system demand governs the frequency of operation.

The vaporizer-mixer should be installed as far from the LP-gas storage tanks as practical. The unit shall be at least 75 ft. from storage tank relief valves or unloading station, at least 15 ft. from any part of the storage tanks and 50 ft. from openings in important buildings.

Installation, initial start-up and field adjustment of the equipment are made by the manufacturer or his representatives. Field service and repair parts are available from the manufacturer.

American Liquid Gas Corp 1100 Santa Fe Av Los Angeles 21 Cal

Algas Combination Vaporizer-mixers. Models 2500, 5000, 10,000, 25,000, 50,000. Model number indicates mixture capacity, cfh. Standard output pressures range from 1 to 5 psi over a Btu/cu ft range of 550–1450.

Algas Combination Vaporizer-mixers. Models 2500-H, 5000-H, 10,000-H, 25,000-H, 50,000-H. Model number indicates mixture capacity, cfh. Output pressures are available to 50 psi over a Btu/cu ft range of 550–1450.

Mixers. Models Algas 2500-M, 5000-M, 10,000-M, 25,000-M, 50,000-M.

RELIEF VALVES, LP-gas

The relief valves listed below are for use on LP-gas storage tanks which are permanently installed in a fixed position for industrial service. The valves are designed to protect against internal over-pressure conditions which might rupture or weaken the tank.

Relief valves of this type are provided with a drain hole at the discharge side of the valve seat to prevent moisture from accumulating and possibly freezing, which could impair proper pressure relief operation. Approved valves are arranged so that the drain can be piped away from the tank to a safe location. This feature is intended to prevent discharging LP-gas from venting through the drain hole which, when ignited, could result in flame impingement on the tank or fittings, thereby causing weakening and ultimate failure.

The proper selection and installation of a relief valve are very important and must be in conformance with applicable code requirements as well as the recommendations of the Factory Mutual Engineering Division.

ACF Industries Inc Box 109 Milton Pa

LP-gas Relief Valves.

Designation	Start-to-discharge pressure, psi	Discharge rate cfm air 60°F equi
S-1008-A	100	7,200
-G	110	8,300
-B	125	9,110
-C	200	15,000
-D	220	15,420
-F	280	18,380
S-1011-A	100	7,200
-G	110	8,300
-B	125	9,110
-C	200	15,000
-D	220	15,420
-F	280	18,380
S-1006-A	100	7,200
-G	110	8,300
-B	125	9,110
S-1007-A	100	7,200
-G	110	8,300
-B	125	9,110
1001-AA	100	6,100
-A	100	7,080
-B	125	7,580
-C	200	14,130
-D	220	14,320
-F	280	16,120
SR-1006-A	100	7,810
-B	125	7,980
SR-1007-A	100	7,810
-B	125	7,980

Bastian-Blessing Co 4201 W Peterson Av Chicago 46 Ill

Rego. LP-gas Relief Valves.

3132B*	125	2,030
3132C*	186	2,510
3132G*	280	4,000
3133B*	125	3,230
3133C*	186	3,920
3133G*	280	6,080
3134B**	125	5,040
3134C**	186	6,220
3134G**	280	9,580
3135B*	125	2,980
3135G*	280	5,770
3149B	125	5,280
3149G	280	10,200
A3149B	125	5,280
A3149G	280	10,200

* Requires separately ordered Cat No. 3133-11A drain-hole pipe-away elbow and Cat No. 3133-10, 3130-10, or 3135-10 vent-stack break-away adapter.

** Requires separately ordered Cat No. 3134-20 vent-stack break-away adapter.

Rego. LP-gas Relief Valve Manifolds. 4 in. flanged inlet.

Manifold No.*	Relief valve No.**	Relief valves per manifold	Nominal start-to-discharge pressure, psi	Net discharge rate cfm in air @ 60° F
8562B, 8572B	3140MB	2	125	4,600 (any 1 valve)
8563B, 8573B	3140MB	3	125	9,200 (any 2 valves)
8564B, 8574B	3140MB	4	125	14,600 (any 2 valves)
8562G, 8572G	3149MG	2	280	9,280 (any 1 valve)
8563G, 8573G	3149MG	3	280	18,560 (any 2 valves)
8564G, 8574G	3149MG	4	280	27,720 (any 3 valves)
A8562B, A8572B	A3140MB	2	125	4,600 (any 1 valve)
A8563B, A8573B	A3140MB	3	125	9,200 (any 2 valves)
A8564B, A8574B	A3140MB	4	125	14,600 (any 2 valves)
A8562G, A8572G	A3149MG	2	280	9,280 (any 1 valve)
A8563G, A8573G	A3149MG	3	280	18,560 (any 2 valves)
A8564G, A8574G	A3149MG	4	280	27,720 (any 3 valves)

* 6 in number indicates 6½ in. diam bolt circle.
7 in number indicates 7¼ in. diam bolt circle.
Prefix A indicates use of relief valves of all-ferrous construction. No prefix indicates use of relief valves of brass-ferrous construction.
** M indicates relief valve rated for this manifold service.

Governor Co Marshalltown Ia
Relief Valve.

	Set-to-discharge pressure, psi	Discharge rate cfm air @0°F 0psi	Inlet size, in.
Micromatic	220	10,570	2

RELIEF VALVE, General Sevice

The Micromat pressure relief valve is designed primarily for beer storage tank service; however, it can be used for other applications provided the fluid medium is compatible with valve parts of bronze, stainless steel and neoprene rubber.

Fluid Co 548 Pierment Av Hillsdale N J
Safety Valve M. Operating pressure adjustable between either 15 psi or 12-25 psi by spring selection.

TORCHES & FURNACES, Portable, LP-gas-fired

The approved portable liquefied-petroleum gas torches and furnaces are intended for general utility service in place of ordinary gasoline blow torches. Care must be taken in setting-up the equipment to make certain that all joints are gas-tight.

The equipment consists of a propane cylinder, hand valves, rubber hose for connecting torches, and a plumber's furnace, which can be attached to the cylinder valve.

Bern-Gas Corp 916 E Woodbridge Av Detroit 7 Mich
Bern-Gas Plumber's Furnace and Hand Torches.

ACETYLENE GENERATORS

Acetylene generators involve considerable explosion hazard if poorly constructed, improperly operated, or opened up for charging or repairs in the presence of open flames or other ignition sources.

Only approved generators should be used. They should be in the charge of responsible operators, and only competent men familiar with the hazards should have access to them.

Approved generators are designed to minimize the possibility of flash-back into the unit. A hydraulic flash arrester is provided at the outlet. Safety relief valves prevent building up excess internal pressures which would render the acetylene unstable and liable to explosive decomposition. Interference mechanisms are also usually provided to prevent dangerous conditions developing from improper valve operations or improper recharging sequences.

Generators are available for service at either low or medium pressures. Low-pressure generators deliver acetylene at not more than one psi; medium-pressure at not more than 15 psi. Pressures higher than 15 psi involve extreme hazard and are generally prohibited. Generators listed are medium pressure.

ACETYLENE GENERATORS, Portable

Portable generators are used in place of cylinders both indoors and outdoors in connection with portable cutting and welding equipment. They should not be permanently connected to an acetylene piping system, and generators with more than 50 pounds carbide capacity should not be used indoors. All generators should be taken outdoors when they are opened for charging, repairs, maintenance, or any other reason.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y
Oxweld. MP-7. 50 lb carbide capacity.
Oxweld. MP-10. 15, 25 lb carbide capacity.

ACETYLENE GENERATORS, Stationary

Stationary-type generators are approved for use in outside generator houses of special design; or the smaller sizes may be used inside a building in separate fire-resistive enclosures, next to an outside wall having adequate provision for venting and explosion.

Air Reduction Co Inc 150 E 42nd St New York 17 N Y
AIRCO. Single rated 300 lb. Double rated 300, 500 lb.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y
Oxweld. MP-7. 50 lb carbide capacity.
Oxweld. MP-11. 500 lb carbide capacity. Total hourly output rating 1000 cfh.

National Cylinder Gas Div Chemetron Corp 840 N Mich Av Chicago 11 Ill
Torchweld. Model A-Twin. 250, 400, 600, 1000, 1200 lb carbide capacities.
Torchweld. Model TWA. 125, 200, 300, 500, 600 lb carbide capacities.

Rexarc Inc W Alexandria O
Model A. 125, 200, 300, 500, 600 lb carbide capacities.
Model A-Twin. 250, 400, 600, 1000, 1200 lb carbide capacities.

ACETYLENE GENERATORS, Control Unit

This device permits synchronizing the operation of two or more Oxweld type MP-5 acetylene generators. It makes possible equalizing the delivery rate from the generators and maintaining the acetylene supply at a constant pressure. The generators may be arranged to operate on a predetermined schedule to run out of carbide one at a time or in alternate groups.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y
Oxweld. Type GC-4.

ACETYLENE BOOSTER SYSTEM

This equipment is designed to supply acetylene at pressures not greater than 15 psi to service lines for welding and cutting operations in plants where acetylene at less than 1 psi is available from a gas holder supplied by one or more low pressure generators.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y
Oxweld Acetylene Booster System. B-2.

TORCHES, REGULATORS, for Oxy-acetylene and Similar Equipment

Approved torches and regulators are designed so that, despite the inherent hazard of the gases involved, accidents due to equipment failure are very rare. A major fire hazard is often presented when portable equipment is used for cutting and welding purposes where sparks or molten globules of metal can ignite combustible materials. For detailed suggestions on the safe use of cutting and welding torches, see the Factory Mutual manual Organizing Your Plant for Fire Safety.

In the listings, torches and attachments within a grouping differ in such specifications as length and head angle. Regulators differ in gas use, connections, capacity, and gages.

Air Reduction Co Inc 150 E 42nd St New York 17 N Y

Airco Hand Welding Torches. Series 200, 400, 700, 750, 9100, 9300, 9900 (prefixed by 818). Series 800, 9200, 9800 (prefixed by 819).

Airco Hand Welding Torches. Style 450.

Airco Hand Cutting Torches. Series 2000, 3000, 4000, 6100, 6500, 9500 (prefixed by 823).

Airco Machine Cutting Torches. Series 2500, 4200, 4700, 4800, 5800, 6400, 6700 (prefixed by 823).

Airco Cutting-torch Attachments. Series 0490, 700, 800, 1000, 1490, 2000, 2400, 3700, 3800, 9100, 9800, 9900 (prefixed by 822).

Airco Air-acetylene Torch. Stock No. 818-0200.

Airco Oxygen Lance Torch. Stock No. 822-1000.

Airco Flame Hardening Torch. Series 4300 (prefixed by 820).

Airco Hand Scarfing Torch. Series 6000 (prefixed by 822).

Airco Regulators for cylinder use. Series 100, 200, 400, 500, 800, 1100, 1800, 8000, 8100, 8200, 8500, 9400 (prefixed by 805 or 806 as applicable).

Airco Regulators for cylinder or manifold use. Series 8400 (prefixed by 805 or 806). Series 8800 (prefixed by 806).

Airco Regulators for pipe-line use. Series 8700, 9000 (prefixed by 805 or 806 as applicable).

Airco Regulators for heavy-duty oxygen lines. Stock No. 806-0006. No. 806-0005 (with pilot, 806-8998).

Airco Regulators for heavy-duty acetylene manifolds. Stock Nos. 806-0004 (with pilot 806-0005), 806-0007, 806-0009.

Bastian-Blessing Co 4201 W Peterson Av Chicago 46 Ill

Rego Regulators for cylinder use. Series 1600, 1620, 2090.

Rego Regulators for LP-gas pipe-line use. Series 1586F, 1586C, 1588F, 1588C.

Rego Regulators for acetylene, oxygen, or hydrogen pipe-line use. Series 1684, 1686, 1688.

Rego Cylinder Regulators for oxygen. Types M3060, M3061.

Rego Cylinder Regulators for acetylene. Types 3063, 3065.

Rego Cylinder Regulators for hydrogen. Types M3066, M3067.

Rego Manifold Regulator for oxygen. Type M3070R.

Rego Manifold Regulator for acetylene. Type 3071R.

Rego Manifold Regulators for hydrogen. Types M3072R, M3079R.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y

Oxweld Hand Welding Torches. Types W-15, -17, -22, -25, -28, -29, -30, -33, -45, -47.

Oxweld Hand Cutting Torches. Types C-31, -32, -62, -63, -66.

Oxweld Cutting-torch Attachments. Types CW-23, -29, -45.

Oxweld Machine Cutting Torches. Types C-37, -39, -43, -48, -52, -54, -56, -58, -60, -60-S

Oxweld Heating, Heat-treating Torches. Types W-32, -39, -40, -41, -42, -43, -44.

Oxweld Hand Deseaming Torches. Types C-51, -53.

Oxweld Powder Cutting Torch. Type AC-4.

Oxweld Powder Deseaming Torch. Type AC-6.

Oxweld Powder Cutting Torch Attachments. Types 1400-ACA-2, 1500-ACA-1, 1500-ACA-3, 1700-ACA-1.

Oxweld Powder Dispensers. For use with approved adjuvant cutting and scarfing equipment. Types D-4, D-

Purox Hand Welding Torches. Types 00, 00-D, 5, 52, -201, -202.

Purox Hand Cutting Torch. Type E.

Purox Cutting-torch Attachments. Types 23, CW-

Purox Machine Cutting Torch. Type C-205.

Prest-O-Lite Hand Welding-cutting Torch. No. 620.

Oxweld Regulators for cylinder use. Types R-32, -44, -64-C, -64-CR, -64-MFD, -64-MNS, -65 (400), -65-C, -65-R, -65-CR, -65-MFD, -65-MNS (04x97), -65-MNS -66, -66-CA, -66-R, -67, -67-EH, -68, -73, -73-MNS, -80 (400), -81, -82, -89, -89-OX, -501, -550, -551, -552.

Oxweld Regulators for manifold use. Types R-33, -83.

Oxweld Regulators for line-on-station use. Types R-37, -38, -38-C, -38-R, -39, -30-H, -39-R, -53-3M, -53-10M, -53-8M, -53-6M-15, -53-8M-15-L, -53-40M, -54-3M, -54-8M, -56-R, -87, -87-R, -95, -96, -99-3M, -99-5C.

Oxweld Station-type Regulators. Types R-801, -802, -803, pilots R-611, -612, -613, -614 as applicable.

Prest-O-Weld Regulators for cylinder use. Types R-102, -104, -109, -121, -122, -123, -125, -126, -127, -127-L, -128, -130, -130-L, -130-EH, -130-EH-L, -131.

Purox Regulators for cylinder use. Types R-201, -201-C, -202-C, -203, -203-CA, -205, -205-C, -206, -206-C, -207, -207-L, -210, -210-L, -210-EH, -210-EH-L, -211, -222.

Purox Regulators for station use. Types R-208, -208-C, -

Prest-O-Lite Regulators for cylinder use. Types R-411-BD, -411-MC, -411-MCD, -412, -413, -413-B, -415-MC.

National Cylinder Gas Div of Chemetron Corp 840 W Chicago 11 Ill

Torchweld Hand Welding Torches. Model Nos. 44, 45,

Torchweld Cutting-torch Attachments. Model Nos. 58-1.

Torchweld Hand Heating Torch. Model No. 51.

Torchweld Hand Scarfing Torches. Model Nos. 36, 37-4, 76.

Torchweld Hand Cutting Torches. Model Nos. 32, 75-1, 78, 84, 84-1, 85.

Torchweld Machine Cutting Torches. Model Nos. 60, 63-8, 66-8, 67-16, 68, 69, 70, 71, 72, 73, 74, 77, 77-8, 80, 81, 82, 5900, 6500, 6580.

Torchweld Regulators for cylinder use. Series 5600, 5700, 5

Torchweld Regulators for oxygen pipe-line or station Model No. 6200.

Torchweld Regulators for acetylene pipe-line or station Model No. 6203.

Torchweld Regulators for hydrogen pipe-line or station Model No. 6207.

Rego Regulators for oxygen cylinder use. Types M3060, M

Rego Regulators for acetylene cylinder use. Types 3063, 3

Rego Regulators for hydrogen cylinder use. Types M3066, M3

Rego Manifold Regulators for oxygen use. Types M3070, M3070N.

Rego Manifold Regulators for acetylene use. Types 3071, 3071N.

Rego Manifold Regulators for hydrogen use. Types M3072, M3072N, M3079, M3079N.

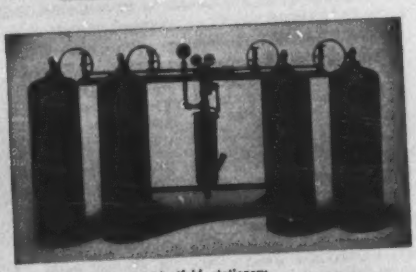
...ylene generator, portable.

Acetylene generator, stationary.

Acetylene generator, control unit.

Torches and regulators on portable gas equipment.

Acetylene booster system.



Manifold, stationary.

Manifold, portable.

Station valves.

Sears Roebuck and Co 925 S Homan Av Chicago Ill

Craftsman Welding Torch. Model No. 624.54741.

Craftsman Cutting-torch Attachments. Model Nos. 624.54440, 624.54771.

Craftsman Regulators for oxygen cylinder use. Nos. 624.54300, 624.54480, 624.54370.

Craftsman Regulators for LP-gas and acetylene use. Nos. 624.54310, 624.54380.

Craftsman Torch and Regulator Kit. Combination Torch No. 624.5515T. Acetylene Regulator No. 624.5515A. Oxygen Regulator No. 624.5515X.

MANIFOLDS, for Oxy-acetylene and Similar Equipment

Stationary manifolds are designed to supply fixed piping systems, and usually involve a larger number of connected cylinders than do portable manifolds. Because the hazard increases with the gas capacity, approved stationary manifolds are strongly constructed of double, extra-heavy steel pipe and heavy forged steel fittings. They should be securely bolted to the floor or wall, and operation of the unit should be in the charge of a responsible employee.

Portable manifolds are used to connect cylinders to supply a heavy demand from portable equipment. To avoid unreasonable fire hasard, no more than a 2000 cubic foot cylinder capacity, equivalent to eight cylinders, should be so connected.

Air Reduction Co Inc 150 E 42nd St New York 17 N Y

Airco Acetylene Manifolds. Parts Nos. 829-0204, -0433, -0643, -0645, -7023, -7035, -7104, -7106, -7110.

Airco Fuel-gas Manifolds (not for acetylene). Parts Nos. 829-0109, -0099. Stock Nos. 829-3672, -3673, -3674, -3600, -3608, -4400. Equipped with hydrogen service-line connection hydraulic flame arrester, Stock No. 837-3713, or with the dry hydrogen service-line connection, Stock No. 837-3310. The dry hydrogen type is used in applications where hydrogen is not combined with oxygen, air or other gas to support combustion.

Airco Hydrogen Manifold. Stock No. 829-4800. Equipped with a hydraulic flame arrester assembly, Stock No. 837-4802 or with a check-valve assembly, Stock No. 837-4801, which is a service-line connection type and is used only in applications where hydrogen is not mixed with oxygen, air, or other gas to support combustion.

Airco Oxygen Manifolds. Part No. 829-0080. Stock Nos. 829-4700, 829-4716.

Bastian-Blessing Co 4201 W Peterson Av Chicago 46 Ill

Rego Portable Oxygen Manifold. Type 1242.

Rego Portable Acetylene Manifold. Type 1240-A.

Linde Co Div Union Carbide Corp 270 Park Av New York 17 N Y

Oxweld Acetylene Manifolds. Types M-8, M-4, M-2.

Oxweld Oxygen Manifolds. Types M-3, M-20, M-25, M-35. Type M-40 for low pressure liquid oxygen cylinders. Extension types MX-1, MX-3, MX-6.

Oxweld Fuel-gas (other than acetylene) Manifolds. Types M-23, M-24, M-28, M-29, M-38, and M-39. Extension types MX-2, MX-4, MX-7. Where air-oxy-gas or air-gas mixture together with an ignition source can occur in the supply line a suitable hydraulic arrester such as H-12 should be used with the manifold.

Purox Manifold Assemblies. Types 03R66-A (acetylene), 21X56 (oxygen).

Linde Safety Valve. No. 21X74.

National Cylinder Gas Div of Chemetron Corp 840 W Mon... Chicago 11 Ill

NCG Oxygen Manifolds. Model Nos. 4X, 5X, 6X.

NCG Acetylene Manifolds. Model Nos. 4A, 5A, 6A.

NCG Hydrogen Manifolds. Model Nos. 4H, 5H, 6H. 2XC, 2XT.

NCG Hydrogen Manifolds. Model Nos. 1XC, 1XT, 2XC 2HC, 2HT.

NCG Acetylene Manifolds. Model Nos. 1AC, 1AT, 2AC 2AC, 2AT.

NCG LP-gas Manifolds. Model Nos. 1LP-T, -C, 2LP-T, 2LP-T, -C.

OXYGEN-LINE FILTERS

Line filters in oxygen distribution systems are signed to protect regulators and other equipment pipe scale and dirt.

Linde Co Div Union Carbide Corp 270 Park Av New York

Oxweld Oxygen Line Filters. Types S-5, S-6, S-7.

STATION VALVES, for Oxy-acetylene Similar Equipment

Station valves are used on drop lines or risers of distribution piping systems and permit independ operation of the gas supply lines for such local u cutting and welding. They also provide a mean closing off individual supply outlets for equipment moval or repair. The valves are of the packless, phragm type and are equipped with standard pipe thr at the valve inlet and provided with a threaded co connection to accommodate a suitable regulator or h connection nut. Three types are available under equipment listing.

One type is manually opened or closed by turning threaded valve stem and, in this type, gas may l through the valve in either direction. A second ty similar to that described above, includes a spri loaded ball check arrangement in the valve inlet pass which closes on reverse flow to prevent excessive leak to upstream piping. A third type is of the non-retu flow design and is a combined shutoff and flow che valve. A guided, but detached valve seat is held o by the flowing pressure when the wheel and stem a in the open position. When subjected to back pressu the valve closes on the seat. Manual closure is accom plished in the regular manner. This type requires th the valve be positioned with the body upright and th connections in a horizontal place. This valve may al be equipped with a light spring which tends to de the detached valve.

Air Reduction Co Inc 150 E 42nd St New York 17 N Y

Airco Station Outlet Valves for oxygen at 250 psi. Konnec flow design. Stock Nos. 801-0469, 801-0233, 801-0269. ¼ in.

Airco Station Outlet Valve for acetylene at 15 psi and cl

...ssure at 50 psi. Nonreturn flow design. Stock Nos. 801-0468, ...0222. ¼ in.
...ro Station Outlet Valves for acetylene at 15 psi, other fuel ...and oxygen at 350 psi. Nonreturn flow design. Stock ...801-0471. 1 in.

...-Hoesing Co 4301 W Peterson Av Chicago 46 Ill
...ro Station Valves for oxygen. Nos. 7160, 7162. Maximum ...inlet pressure 300 psi.
...ro Station Valves for fuel gas. Nos. 7161, 7163. Maximum ...inlet pressure 300 psi.

...ical Cylinder Gas Div of Chemetron Corp 840 N Michigan Av ...Chicago 11 Ill
...ation Valve for oxygen. No. M-900R. Maximum rated inlet ...sure 300 psi.
...ation Valve for fuel gas. No. M-901. Maximum rated inlet ...sure 300 psi.

FLAME ARRESTERS, for Oxy-acetylene and Similar Equipment

...Hydraulic flame arresters are used in acetylene and ...er fuel gas piping systems at branch-line divisions ...at station outlets. They are intended to relieve any ...normal pressure in the piping and to prevent the ...ure flow of oxygen at cutting torch or other station ...ipment from entering the piping. It is also intended ...arrest flashback which may occur in the event air ...oxygen becomes mixed with the fuel gas downstream ...the arrester.

...Reduction Co Inc 150 E 42nd St New York 17 N Y
...ro Dry Flame Arrester for use in acetylene cylinder-connecting ...s. Type A.
...ro Hydraulic Flash Arresters for acetylene branch-line ...ice. Style 0568. Maximum operating pressure 15 psi.
...ro Hydraulic Flash Arresters for acetylene branch-line or ...ion service. Stock Nos. -0091, -0092, -0093 (prefixed by 801).
...ro Hydraulic Flash Arresters for fuel gas other than acetylene. ...k Nos. 0101, 0102, 0103 (prefixed by 801). Maximum oper... pressure 25 psi.
...ro Hydraulic Flame Arrester. No. 801-0315. For handling ...nufactured or natural gases at 1 psi max.

...ide Co Div Union Carbide Corp 270 Park Av New York 17 N Y
...rald Hydraulic Flash Arresters. Types H-3, H-4, H-9. ...imum operating pressure 15 psi.
...rald Hydraulic Flash Arresters. Type H-7. For operating ...sures below 1 psi.
...rald Hydraulic Flash Arresters for acetylene station service. ...pe H-11-1M, H-11-3M, H-11-6M.
...rald Hydraulic Flash Arresters for fuel-gas (other than ...ylene) station service. Types H-12-3M, H-12-6M.
...Frost-O-Lite Ahundum Flash Arrester. No. 40. For use with ...premixed acetylene at cylinder pressure in leads connecting ...linder and manifold header.

...ical Cylinder Gas Div of Chemetron Corp 840 N Michigan Av ...Chicago 11 Ill
...NCG Hydraulic Flame Arresters for acetylene branch-line or ...ation service. Models M-1230, M-1250, M-1270, M-1280, ...-1290. Maximum operating pressure 15 psi.
...NCG Hydraulic Flame Arresters for use with fuel gases (other ...an acetylene) in branch-line or station service. Models M-1230F, ...-1250F, M-1270F, M-1280F, M-1290F. Maximum operating ...ssure 25 psi.

FLAME ARRESTERS, for Gas Piping Systems

Flame arresters of this type are approved for installation in communicating piping carrying an explosive mixture of fuel gas (manufactured, natural, propane, butane) and air at pressures not exceeding 5 psi to burners to prevent a flashback through burners from reaching back to equipment in the system not strong enough to withstand explosion pressures. Piping connected to the outlet connection should not be of greater diameter than the pipe size of the arrester.

They are equipped with special elements for arresting the severe explosion wave which may be already established in a long pipe. These devices also contain a thermally operated, manual resetting shutoff valve to stop flow of fuel gas-air mixture in the event of flashback and continued burning at the arrester element.

Under certain critical conditions of size and arrangement of burner manifold piping and with fuel gases containing large proportions of hydrogen, a flashback through burners may result in a high velocity shock wave (detonation). Because of the possibility of ignition of the fuel gas-air mixture through the flame arrester under these infrequent critical conditions we recommend the installation of an additional safeguard against interruption of production in the form of a safety blowout device to be installed close to the outlet of the gas mixing and compressing equipment. A safety blowout device consists of a combination of a flame arrester, check valve and pressure relieving bursting disc. Such devices are obtainable from manufacturers of approved flame arresters for communicating piping.

C M Kemp Mfg Co Glen Burnie Md
Kemp Fire Checks. Type QA. Models FR, MS, FR-MS. Size is indicated by model suffix 100 (⅛ in.), 200 (¼ in.), 300 (1 in.), 400 (1¼ in.), and 500 (1½ in. ips).

Selas Corp of America Dresbertown Rd & Limekiln Pike Dresher Pa
Selas Automatic Fire Check. Types AF, AFS. ⅛, ¼, ½, 1, 1¼, 1½, 2, 3 in. AFS has auxiliary switch which can be arranged to shut down the mixer equipment or sound an alarm. Types AF-8A (1 in.), AF-12A (1½ in.), AF-16A (2 in.), AF-20A (2½ in. ips).

REELS, for Gas Hose

This equipment is for storing and handling oxygen and acetylene hose. The reels are spring loaded and allow the hose to be unreeled as desired. They do not retract until released by a slight tug on the hose.

United Specialties Inc Main & Mosby Sts El Dorado Ark
Weldreel. Model OA-A. Capacity 50 ft of 3/16 in. or 40 ft of ¼ in. oxygen and acetylene hose. With or without hose. Can be mounted on cart, floor, wall or ceiling.

GAS FLUXERS

Gas fluxers are welding accessories intended to eliminate the need of dipping welding rods into powdered flux before using. In these devices the acetylene supply to the brazing torch bubbles through a fluxing solution which evaporates and provides the necessary flux in the torch flame. As part of acetylene piping systems, they would be subject to the possibility of internal explosions, unless of adequate strength to avoid rupture.

All-State Welding Alloys Co Inc 249-255 Ferris Av White Plains N Y
All-State Jet-Flux Dispensers. Models Standard (flux capacity ½ gal), Jumbo (1 gal).

Gasflux Co 141-145 N Logan St Elyria O
Models R, 69 and 86. Capacity approx 1 qt.

Rexarc Inc W Alexandria O
Rexarc Liquifluxer. Models 16, 16-L, 17, 17-L, 18, 18-L.

GAS ANALYZERS

Combustible-gas analyzers detect the presence of flammable vapors or gases and warn when mixtures with air approach the explosive range. Approved analyzers are grouped according to their use but the operating principle is the same for all. The gas or vapor passes over a heated catalytic filament where it burns. The heat, directly proportional to the amount of gas or vapor present in the mixture, raises the temperature of the wire. The temperature increase is measured by an electrical circuit.

The characteristic heat of combustion must be considered. Carbon disulfide, for example, gives a low reading because its heat of combustion is low. Low readings may also result when the mixture is taken from a place other than the analyzer and part of the vapors condense out before reaching the filament. Materials such as lead, as in leaded gasoline, may interfere with the catalyst action.

GAS ANALYZERS, Indicators

Analyzers used merely as indicators are lightweight portable units for intermittent analysis of atmospheres where flammable vapors are suspected or used. They should not be carried into the atmosphere which is to be sampled. Hose, tubing, or sampling probes are available to reach otherwise inaccessible places. The sample is drawn through the analyzer cell by a manual pump.

Indicators show mixture compositions of from 0 to 100% of the lower combustion limit. For general use, they are calibrated to give a margin of safety for most common gases or vapors.

Davis Instruments Div Davis Emergency Equipment Co Inc 47 Halleck St Newark 4 N J
Davis Combustible Gas Indicators. Vapotester. Model M-1 (type A), M-6 (with 10-1 range multiplier). For [illegible] combustible gases and vapors.
Davis Combustible Gas Indicator. Vapotester. [illegible] (type L). For leaded gasoline vapors.
Davis Combustible Gas Indicator. Gastester. Type 11-550, and Model M-5. For gases ranging from 0-[illegible]
Davis Bantam Vapotester.

Johnson-Williams Inc 2625 Park Blvd Palo Alto Cal
J-W Combustible Gas Indicator. Model F.
J-W Sniffer Combustible Gas Indicator. Model G. Gas [illegible] for sampling leaded gasoline vapors.
J-W Combustible Gas Indicator. Gas Pointer. Model [illegible] natural gas ranging from 0–100% gas.

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh
MSA Explosimeter. Model 2.

Mine Safety Appliances Co of Canada Ltd 580 Hi[illegible] Postal Station E Toronto Ont
MSA Explosimeter. Model 2.

Safety Supply Co 214 King St E Toronto 2 Ont
J-W Combustible Gas Indicator. Model F.
J-W Sniffer Combustible Gas Indicator. Model G. Gas [illegible] for sampling leaded gasoline vapors.
J-W Combustible Gas Indicator. Gas Pointer. Model [illegible] natural gas ranging from 0–100% gas.

GAS ANALYZERS, Alarms

Gas-indicating alarms are portable or fixed [illegible] ments for either continuous or intermittent use. [illegible] are preset to give an audible or visual alarm at [illegible] 30% of the lower explosive limit. They are placed [illegible] spaces or areas where combustible gases or vapors [illegible] not normally present but may accumulate acci[illegible] Some sample the surrounding atmosphere by diffu[illegible] of the gases through louvers in the instrument [illegible] others with pumps operating continuously.

Each analyzer is matched to a specific hazard. [illegible] manufacturer's operating and maintenance instruc[illegible] must be followed.

Davis Instruments Div Davis Emergency Equipment Co [illegible] 47 Halleck St Newark 4 N J
Diffusion Head Series-type and Selective-type Combu[illegible] Analyzers. Series 11-3000. Fixed and continuous.
Davis Explosionproof Gas Alarm. Series 11-3500. Portable and continuous.

Johnson-Williams Inc 2625 Park Blvd Palo Alto Cal
J-W Alarm. Model E. Fixed and continuous.
J-W Sentinel Combustible Gas Alarm. Portable and [illegible] mittent.
Beckman/J-W Combustibles Analyzer. Model 6C. Fixed [illegible] continuous. For petroleum hydrocarbons (pentane and [illegible] and hydrogen-air mixtures furnished to the instrument at [illegible] 3 psi.

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh [illegible]
MSA Explosilarm. Fixed and continuous.
MSA Explosilite Gas Alarm. Portable and intermittent.

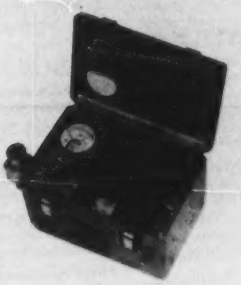
Safety Supply Co 214 King St E Toronto 2 Ont
J-W Alarm. Model E. Fixed and continuous.
J-W Sentinel Combustible Gas Alarm. Portable and [illegible] mittent.

Acet. gas burn.

Gas flamer.

Gas analyzer, controller.

Flame arrester, oxy-acetylene.



Gas analyzer, alarm.

Gas analyzer, indicator.

Gas analyzer, indicator.

Gas analyzer, indicator.

Beckman/J-W Combustibles Analyzer. Model 6C. Fixed and continuous. For petroleum hydrocarbons (pentane and heavier) and hydrogen-air mixtures furnished to the instrument at about 3 psi.

GAS ANALYZERS, Controllers

The controller is a fixed installation and is the most complex and versatile type of analyser. Controllers equipped with relays may be used to shut down processes and operate ventilating fans or other equipment.

Ordinarily, controllers are set to give an alarm at about 40% of the lower limit and to shut down the process at 50%. They visually indicate sample compositions over the range from 0–100% of the lower limit and can be preset to give visual and audible alarms automatically at any desired composition.

Controller equipment must be carefully matched to the specific hasard. Before an installation is made, plans and specifications should be sent to the Factory Mutuals. Once installed, a high standard of maintenance by properly trained personnel is required, with adjustments made daily. A maintenance contract with the manufacturer is recommended.

Davis Instruments Div Davis Emergency Equipment Co Inc 47 Hallock St Newark 4 N J

Davis Combustible Gas Alarm System. Series 11-3600. Remote-head type and tube-sampling type. Available in explosionproof construction.

Davis Precision Combustible Gas-analyzing Equipment. Series 11-8600. With supervisory control and fail-safe feature. Remote heads also available for high-temperature operation.

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh 8 Pa

Lor-Ann Combustible Gas Detector. Model LA 101, Type RH.

Explosionproof Combustible Gas Detectors. Tube-sampling Types EXS, EXS-T, EXS-M, EXSM-T, EXS-S. S indicates Sensitrol contacting meter, M indicating meter, T trouble circuit. May be obtained with multiple-sampling valve for touring 4, 6, or 8 points.

M-S-A Combustible Gas Analyzers. Model F. With supervisory control and fail-safe features. Includes both remote-head and tube-sampling types. Remote heads also available for high-temperature operation.

GAS MIXERS

Mechanical gas mixing equipment is used in s industrial gas burning installations to supply mixtures which remain at nearly constant ratio a wide range in burner demand. Approved mixe designed to vary not more than 2-3% even th the load demand is varied from 5% to 100% of ma capacity.

Because, in many cases, the gas-air mixtur charged from the machine is explosive, considera should be given to protect the machine from explo which may occur in downstream piping. It is re mended that this protection be in the form of a s fire check and safety blowout device installed in th charge line near the mixing equipment. Under cr critical conditions which involve piping arrange as well as the gas composition, even these devices not guarantee against some equipment damage in event of violent shock wave (detonation). How these conditions occur infrequently and the resu damage can be reduced by such protection.

Gas mixing machines should be located in an out detached building or a well-ventilated enclosure i main building. Under favorable conditions the mixer may be located in a large well-ventilated ma facturing room.

Eclipse Fuel Engineering Co Rockford Ill

Cane Type Diluters. Use valve size Nos. 16, 24, 32, or 40.

Consta-Mix Proportioning Valves. Cat Nos. 15CM, 20 60CM.

Gas Appliance Service Co 1940 W Balmoral Av Chicago 13

Furkert Gas/Air Mixer. Model Nos. 30, 42, 60, 100, 200 300AB, 400AB, 500AB, 600AB. Gas mixing machines.

C M Kemp Mfg Co Glen Burnie Md

Series S. Nos. 2, 3, 5, 7, 8, 10, 20.

Industrial Carburetors. Series T. Nos. 1, 1½, 2, 3, 3A.

Selas Corp of America Dresbertown Rd & Limekiln Pike Dre Pa

Combustion Controllers. Type J. Series 5-C, 10-C, 20-C, 6 60-C, 100-C, L-14, L-20, ND, LD, FD.

Waukee Engineering Co 5138 N 38th St Milwaukee Wis

Gas/Air Mixers. Types P-400, -600, -1000, -1500, and B -501, -1001, -1501, -2501, -3501, -4001. Mixture capacities r from 400-4000 cfh at 1, 2, or 3 psi.

FUEL & COMBUSTION CONTROLS

TERNAL HEATERS for Ovens and Furnaces

ese heater units are usually mounted outside the or furnace and are equipped with a well-arranged y-control system for protection against the fuel- sion hazard. They may be fired by one or more ers.

ternal heaters for ovens and furnaces are of two types. One is direct-fired, the products of com- on from the heater being circulated throughout oven or furnace work chamber to heat the oven or ace atmosphere directly. The other is indirect- , the products of combustion, rather than entering work chamber directly, heat the oven or furnace osphere as they are recirculated over heat-exchanger s. The indirect-fired heater has the advantage that fuel- plosion hazard is restricted to the heater- stem or tube system.

ince these heaters are used with ovens or furnaces a variety of special processes, the Factory Mutual ss Manufacturer's Questionnaire or Furnace Manu- turer's Questionnaire should be filled out by the nufacturer or installer and submitted to the Factory tual Engineering Division for acceptance before k is started. This procedure should be made a dition of the purchase contract.

TERNAL HEATERS, Oil-fired

strial Gas Engineering Co 130 E Quincy St Westmont Ill
Universal Oil-Fired Oven Heater. All sizes.

Ross Engineering Corp 444 Madison Av New York 22 N Y
ross Air Heaters. Types D, DF, F, H, indirect-fired. Type N, ct-fired.

TERNAL HEATERS, Gas-fired

ing Systems Co Div Thor Power Tool Co 1800 Foster Av Chicago Ill
Dry-Sys Unit Heater. IDL. Size Nos. 1, 2.

Industrial Gas Engineering Co 130 E Quincy St Westmont Ill
Universal Heater with Industrial Gas Engineering Control tinct. All sizes.

I Rockwell Co 200 Elliott St Fairfield Conn
Gehnrich Direct-fired Air Heaters. Sizes 250 AG, 300 AG, 0 AG, 750 AG, 1000 AG, 2000 AG.

Ross Engineering Corp 444 Madison Av New York 22 N Y
Ross Air Heaters. Types D, DF, F, H, indirect-fired. Type N, ct-fired.

Surface Combustion Corp 2375 Dorr St Toledo O
Surface Combustion Direct-fired Air Heaters. Types AOP, LP, S.

United States Hoffman Machinery Corp 103 Fourth Av New York 3 N Y
U. S. Hoffman Indirect-fired Air Heaters. Models S-350, S-700.

OVEN-DOOR LATCHES, for Explosion Venting

Oven doors properly equipped with explosion-venting latches of approved design can serve as explosion vents which will reduce damage from internal explosion pressures. However, explosion vents will be of questionable effectiveness in the less frequent case of an explosion of a large amount of mixture at "maximum violence" concentration. When installed on an oven or drier door, the number, arrangement, and adjustment of these latches should be such that less than 50 lbs per sq ft internal pressure is needed to open the door.

The approved latches hold doors tightly closed to prevent heat losses. Plants installing these latches should make periodic tests to insure that the explosion-venting feature is operative and not obstructed by corrosion or gummy deposits.

The specified minimum door areas protected by a given approved latch are from calculations based on the considerations that the total force produced on the door by internal pressure can be resolved into one force acting on a point one-half the width of the door and that the latch is installed at a point corresponding to the full door width from the door-hinge axis.

Brizon Mfg Co 864 N Prior Av St Paul 4 Minn
Types H (with handle), P (without handle). Minimum door area protected by size No. 2 should be 1¾ sq ft, by No. 3, 4 sq ft. Adjustable strike No. 2 available.
Junior Model. Minimum door area protected should be from 0.2 sq ft to 0.7 sq ft depending upon latch equipment.

Despatch Oven Co 619 S E Eighth St Minneapolis 14 Minn
Compression Latch. Type AA. Minimum door area protected should be from 3 sq ft to 8 sq ft depending upon latch adjustment.

Grand Rapids Brass Co Div Crampton Mfg Co 420 50th St S W Grand Rapids 2 Mich
Lock No. 4722. Used with Strike No. 3915. Minimum door area protected should be 3 sq ft.

Kason Hardware Corp 71 Wallabout St Brooklyn 11 N Y
No. 2087. Minimum door area protected should be from 1½ sq ft to 2¼ sq ft depending upon latch adjustment.
Type 930-X. Minimum door area protected should be 4 sq ft.
Type 931-X. Minimum door area protected should equal or be greater than 2 sq ft.

No. 188-X. Minimum door area protected should be approx 1¼ sq ft.

Nos. 4887, 5287. Minimum door area protected should be 1½ sq ft.

Lydon Bros Inc 85 Zabriskie St Hackensack N J

Type R_1. Installed in pairs. Minimum door area protected should be from 3 to 10 sq ft depending upon latch adjustment.

Type R_2. Installed in pairs. Minimum door area protected should be from 5½ to 17 sq ft depending upon latch adjustment.

Proctor & Schwartz Inc Seventh St & Tabor Rd Philadelphia 20 Pa

Proctor & Schwartz Explosion-venting Door. For use on Proctor & Schwartz industrial driers only.

W S Rockwell Co 200 Elliott St Fairfield Conn

Type No. 633. Minimum door area protected should be 13 sq ft.

Type No. 634. Minimum door area protected should be 12½ sq ft.

Type No. 689. Minimum door area protected should be 18 sq ft.

PRESSURE-SUPERVISORY SWITCHES

These are operated by the supervised fluid pressure being applied to a built-in bellows, diaphragm or Bourdon tube which is mechanically linked to the switch member. The normal arrangement provides for the switch contacts to open automatically in the event the supervised pressure is reduced to a potentially unsafe point. Other equipment would then act to shut down the combustion process, as applicable. For alarm or other purposes, the switch action may be the reverse.

When ordering, specify type, model, maximum operating pressure, temperature, fluid handled, electrical characteristics and operating pressure desired.

PRESSURE-SUPERVISORY SWITCHES for Fuel Gas

For FM cock application these switches are recommended even though the supervised fluid may not be fuel gas.

Combustion Control Div Electronics Corp of America 1 Memorial Drive Cambridge 42 Mass

Models 80MA-72, -73, -75, -76, -77 (normally closed contacts), 80MB-72, -73, -75, -76, -77 (normally open contacts). Single pole, single-throw contacts with the following ratings: Designation 72 are 6 amp at 115v, 3 amp at 230v a-c, d-c, 1/6 hp at 115/230v a-c, d-c. Designations 73, 75, 76, 77 are 10 amp at 115v, 5 amp at 230v a-c, d-c, ¾ hp at 115/330v a-c, ½ hp at 115/230v d-c.

Model	*Operating range*	*Differential*	*Max pressure*
80MA-72	±1.0–±20.0 in. w c	±0.6–±1.0 in. w c	20 psi
80MB-72	±1.0–±20.0 in. w c	±0.6–±1.0 in. w c	20 psi
80MA-73	½–20 psi	1– 20 psi	30 psi
80MB-73	½–20 psi	1– 20 psi	30 psi
80MA-75	½– 60 psi	3½– 60 psi	80 psi
80MB-75	½– 60 psi	7½– 60 psi	80 psi
80MA-76	1–150 psi	4–150 psi	200 psi
80MB-76	1–150 psi	6–150 psi	200 psi
80MA-77	2–300 psi	12–300 psi	400 psi
80MB-77	2–300 psi	19–300 psi	400 psi

Dewey Gas Furnace Co 101 E Baltimore Av Detroit 2 Mich

Model Nos. D1, 2, 3. Switch capacity 10/5 amp, 125/250v a-c.

No.	*Operating range*	*Differential*	*Max pressure*
D1	1.0–8.0 in. w c	5% set pressure	2 psi
D2	2–32 in. w c	5% set pressure	5 psi
D3	¾–4 psi	4% set pressure	8 psi

Functionally, these switches operate on either positive or negative pressure. The construction is such that [illegible] or vapors are not recommended on the negative pressure side of the diaphragm.

General Controls Co 801 Allen Av Glendale 1 Cal

Cat Nos. L-38E, L-38F. For the supervision of [illegible] factured, natural, and LP-gases in ambient temperatures not exceeding 150°F. Contact capacities: 9.8 amp at 115v, 4.9 amp at 230v a-c; 1.8 amp at 115v, 0.9 amp at 230v d-c. The switch must be mounted in a level position. A spirit indicator is provided. The vent connection must not be plugged. Three types are available with characteristics as follows:

Type	*Operating range*	*Differential*	*Max pressure*
100	3 –14 in. w c	1.3 –3.7 in. w c	[illegible]
101	1 – 8 in. w c	0.6 –1.8 in. w c	[illegible]
103	0.8– 2.8 in. w c	0.17–0.6 in. w c	[illegible]

Mercoid Corp 4201 Belmont Av Chicago 18

Types DAF-21, -22, -23, -24, -31, -32, -33, -34, -[illegible], -534, DAW-23, -33, -533, D8F-231, -332, -433, -234, D[illegible] DAF and DAW groups may have additional subscripts, -2, -3, -4, -54, -103, -127, -156, indicating switch characteristics. For example, DAW-33-3 is SPST, normally closed. Contact ratings range from 20 watts to 10 amp at 115v, or 5 amp at 230v, depending on switch selection.

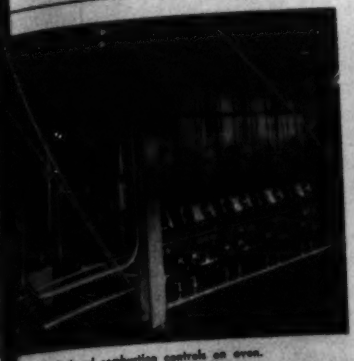
Types PG (fully automatic), PR (manual reset after low pressure operation), PRL (manual reset after low pressure operation). Basic types with normally closed SPST switch contacts. Can be identified with additional subscripts -3, -4, -54, -156, etc., for other contact characteristics. Standard switch rating 0.5 amp at 115/230v, 60c. Several operating ranges are available as listed by type below.

Type	*Operating range*	*Differential*	*Max pressure*
DAF-21, -22, -23, -24	½-14 to 2-300 psi	1-300 psi	[illegible]
DAF-31, -32, -33, -34	½-14 to 2-300 psi	1-300 psi	[illegible]
DAF-531, -532, -533, -534	½-14 to 2-300 psi	½-300 psi	[illegible]
DAW-23	½-14 to 2-300 psi	1-300 psi	[illegible]
DAW-33	½-14 to 2-300 psi	1-300 psi	[illegible]
DAW-533	½-14 to 2-300 psi	½-300 psi	[illegible]
D8F-231, -232, -233, -234	½-14 to 2-300 psi	2 oz (fixed) to 1 psi (fixed)	[illegible]
D8W-233	½-14 to 2-300 psi	2 oz (fixed) to 1 psi (fixed)	[illegible]
PG, PR, PRL; Range No. P-1	±1.0 to ±30 in. w c	0.8–1.0 in. w c	2[illegible]
PG, PR, PRL; Range No. P-2	0.5 to 5.0 psi	1-3 oz	2[illegible]

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn

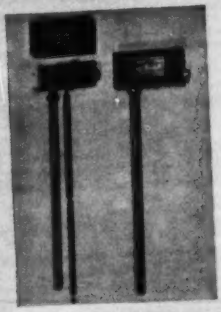
Types C437A, -B, -C, C447A, -B, C645A, -C, -D, C[illegible] P444A, -B, P644A series as tabulated below. Suitable for manufactured, natural, and LP-gases.

Type	*Operating range*	*Differential*	*Max pressure*
C437A1008*	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1065*	1–10 psi	0.1 –0.5 psi	[illegible]
1046*	½–5 psi	0.05–0.25 psi	[illegible]
1010	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1024	1–10 psi	0.1 –0.5 psi	[illegible]
1067	½–5 psi	0.05–0.25 psi	[illegible]
C437B1007*	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1049*	1–10 psi	0.1 –0.5 psi	[illegible]
1081*	½–5 psi	0.05–0.25 psi	[illegible]
1015	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1035	1–10 psi	0.1 –0.5 psi	[illegible]
1064	½–5 psi	0.05–0.25 psi	[illegible]
C437C1006††	1–16 oz/sq in.	0.02–0.6 oz/sq in.	[illegible]
1014††	½–5 psi	0.02–0.15 psi	[illegible]
C437D1008*	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1013*	½–5 psi	0.05–0.25 psi	[illegible]
1031*	1–10 psi	0.1 –0.5 psi	[illegible]
C437E1004*	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1012*	½–5 psi	0.05–0.25 psi	[illegible]
1039*	1–10 psi	0.1 –0.5 psi	[illegible]
C437F1003††	1–16 oz/sq in.	0.1 –0.6 oz/sq in.	[illegible]
1011††	½–5 psi	0.05–0.25 psi	[illegible]

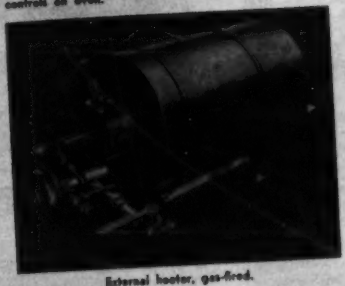


Fuel and combustion controls on oven.

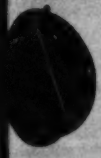
Oven-door latches, explosion venting.

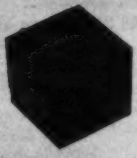


Temperature-limit switch, nonindicating.



External heater, gas-fired.



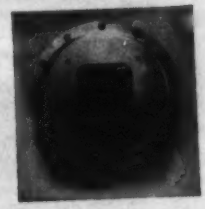


...r interlocking switches.

Time-delay switch.

Temperature-limit switch, indicating.

Airflow interlocking switch.



Pressure-supervisory switches.

Type	Operating range	Differential	Max pressure
C437G1032	1–16 oz/sq in.	0.1 –0.8 oz/sq in.	3 psi
1033‡	1–16 oz/sq in.	0.1 –0.8 oz/sq in.	3 psi
1038	½–5 psi	0.06–0.35 psi	15 psi
1039	1–10 psi	0.1 –0.5 psi	20 psi
C437H1001	1–16 oz/sq in.	0.15–0.8 oz/sq in.	3 psi
1019	1–16 oz/sq in.	0.15–0.8 oz/sq in.	3 psi
1027	½–5 psi	0.25 psi	15 psi
1033	1–10 psi	0.1 –0.5 psi	20 psi
C447A1007	5–30 psi	2 psi	60 psi
1013	10–100 psi	6 psi	200 psi
C447B1006	5–30 psi	2 psi	60 psi
1014	10–100 psi	6 psi	200 psi
C827B1002†	1–16 oz/sq in.	0.1 –0.8 oz/sq in.	3 psi
1038†	½–5 psi	0.06–0.35 psi	15 psi
1019†	1–10 psi	0.1 –0.5 psi	20 psi
C827A1003†	1–16 oz/sq in.	0.15–0.8 oz/sq in.	3 psi
1011†	½–5 psi	0.75–0.35 psi	15 psi
1039†	1–10 psi	0.1 –0.5 psi	20 psi
C848A1023	2–20 in. w c	1–5 in. w c	1.5 psi
1026*	2–20 in. w c	1–5 in. w c	1.5 psi
C848C1030‡‡	± 0.5– ± 5 in. w c	0.3–0.8 in. w c	1.5 psi
1030*‡‡	± 0.5– ± 5 in. w c	0.3–0.8 in. w c	1.5 psi
C848D1011*‡‡	2–20 in. w c	1–3 in. w c	1.5 psi
1043‡‡	2–20 in. w c	1–3 in. w c	1.5 psi
C847A1002	5–30 psi	1 psi	60 psi
1010	10–100 psi	1 psi	200 psi
P428A1080	100–1000 psi	Min. 75 psi	1000 psi
1144	30–300 psi	Min. 22.5 psi	300 psi
1151	50–600 psi	Min. 45 psi	600 psi
1159	200–2000 psi	Min. 150 psi	2000 psi
1177	300–3000 psi	Min. 225 psi	3000 psi
P428B1135	30–300 psi	Min. 22.5 psi	300 psi
1143	50–600 psi	Min. 45 psi	600 psi
1160	100–1000 psi	Min. 75 psi	1000 psi
1168	200–2000 psi	Min. 150 psi	2000 psi
1176	300–3000 psi	Min. 225 psi	3000 psi
P444A1002	5–60 psi	2–20 psi	80 psi
1047	5–150 psi	10–120 psi	200 psi
P444B1041	5–120 psi	10–120 psi	200 psi
1058	5–60 psi	2–60 psi	80 psi

* Requires manual reset following low pressure operation.
‡ Deaerproof models.
† Equipped with SPDT switch.
†† Equipped with two-circuit (one open, one closed) switch.
‡ For air only.

Pyronics Inc 17700 Miles Av Cleveland 28 O

Model	Operating range	Differential	Max pressure
PS-B	0.1– 0.5 in. w c	*	1.5 psi
PS-W	1.0–10.0 in. w c	*	1.5 psi
PS-B	5.0–30.0 in. w c	*	1.5 psi

*Differential— approx 33⅓ of switch operating setting; nonadjustable.

United Electric Controls Co 85 School St Watertown 72 Mass

Type H6X. Model 5415. SPDT switch rated for 15 amp at 115/230/460v 60c.

Model	Operating range	Differential	Max pressure
H6X-5415	2–30 psi	1 psi	50 psi

PRESSURE-SUPERVISORY SWITCHES for Fuel Oil

Combustion Control Div Electronics Corp of America 1 Memorial Dr Cambridge 42 Mass

Models 80MA-73, -75, -76, -77 (normally closed contacts), 80MB-73, -75, -76, -77 (normally open contacts). Single pole, single-throw contacts. Electrical ratings are: 10 amp at 115v, 5 amp at 230v a-c, d-c, ¼ hp at 115/230v a-c, ½ hp at 115/230v d-c.

Type	Operating range	Differential	Max pressure
80MA-73	½–20 psi	1–20 psi	30 psi
80MB-73	½–20 psi	1–20 psi	30 psi
80MA-75	10–90 psi	3½–60 psi	90 psi
80MB-75	10–90 psi	3½–60 psi	90 psi
80MA-76	75–150 psi	6–150 psi	200 psi
80MB-76	75–150 psi	6–150 psi	200 psi
80MA-77	250–300 psi	12–300 psi	400 psi
80MB-77	250–300 psi	12–300 psi	400 psi

Marcoid Corp. 4201 Belmont Av Chicago 41 Ill

Types DAF-21, -22, -23, -24, -31, -32, -33, -34, -531, -532, -533, -534, DAW-23, -33, -533, D8F-231, -232, -233, -234, D8W-233. DAF and DAW groups may have additional subscripts -3, -153, -4, -54, -103, -127, -156 indicating switch characteristics. For example, DAW-33-3 is SPST, normally closed. Control range from 30w to 10 amp at 115v, or 5 amp at 230v, depending on switch selection. There are several operating ranges available with each type:

Type	Operating range	Differential	Max pressure
DAF-21, -23, -23, -24	½–14 to 2–300 psi	1–300 psi	600 psi
DAF-31, -32, -33, -34	½–14 to 2–300 psi	1–300 psi	600 psi
DAF-531, -532, -533, -534	½–14 to 2–300 psi	½–300 psi	600 psi
DAW-33	½–14 to 2–300 psi	1–300 psi	600 psi
DAW-23	½–14 to 2–300 psi	1–300 psi	600 psi
DAW-533	½–14 to 2–300 psi	1–300 psi	600 psi
D8F-231, -232, -233, -234	½–14 to 2–300 psi	½–300 psi 2 psi (fixed) to 1 psi (fixed)	600 psi
D8W-233	½–14 to 2–300 psi	½–300 psi 2 psi (fixed) to 1 psi (fixed)	600 psi

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn

Type	Operating range	Differential	Max pressure
P428A1096	100–1000 psi	Min. 75 psi	1000 psi
1144	30–300 psi	Min. 22.5 psi	300 psi
1151	50–600 psi	Min. 45 psi	600 psi
1159	200–2000 psi	Min. 150 psi	2000 psi
1177	300–3000 psi	Min. 225 psi	3000 psi
P428B1133	30–300 psi	Min. 22.5 psi	300 psi
1143	50–600 psi	Min. 45 psi	600 psi
1160	100–1000 psi	Min. 75 psi	1000 psi
1168	200–2000 psi	Min. 150 psi	2000 psi
1176	300–3000 psi	Min. 225 psi	3000 psi

TEMPERATURE-SUPERVISORY SWITCHES for Fuel Oil

These switches are used as temperature interlocks in safety-control circuits of oil-fired burner equipment. They may also be used for alarm purposes to indicate high or low fuel-oil temperatures.

Marcoid Corporation 4201 Belmont Av Chicago 41

Types FM-437, FM-437-HP, FM-437-3, FM-437-38, FM-437-153 (low or high limit). Adjustable ranges: 40-240°F with adjustable differentials of 10–120 or 15–120°F respectively. Rated max. pressure and temperature: 200 psi at 300°F or 450 psi at 200°F. Standard electrical ratings: 10/5 amp, 115/230v a-c or d-c. Other electrical ratings available.

TEMPERATURE-LIMIT SWITCHES

These devices are intended to be used with industrial heating equipment to prevent excess temperature in the event the temperature controlling equipment fails. It is preferable that temperature limit switch action automatically result in a shut down of the heating system and to do this, normally closed switch contacts are generally used.

TEMPERATURE-LIMIT SWITCHES, Indicating

Alnor Instrument Co Div of Illinois Testing Laboratories Inc 420 N Lafalle St Chicago 10 Ill

Type N-30, N-34. Several ranges available between 0-400 and 0–3000°F. Operates on 115 or 230v, 60c. Contact rating 10/5 amp, 115/230v a-c. N-34 requires reset switch operation when initially powered.

Marcoid Corp 4201 Belmont Av Chicago 41 Ill

Type MX-51R. 50–650°F range. Load contact rating 10/5 amp, 115 or 230v, 60c or 5000 watts a-c noninductive.

Partlow Corp 2 Campion Rd New Hartford N Y

Model HL15-10. 9–900°F range. Load contact ratings: 15 amp, 250v, 60c.

PERATURE-LIMIT SWITCHES, Nondicating

Instrument Co 16 River Rd Chatham N J
Switch. Model H-18 (two digits) -FM. for operation to 1800°F. Contact ratings: 15 amp, 250v ac.
Temperature Limit Switch. Model F(1, 2 or 3)C(three -FM. Available in various ranges to 2000°F. Contact 15 amp, 250v, 60c.
Temperature Limit Switches. Models B-1C(two digits)-FM, (two digits)-FM. Available in various ranges to 1000°F. ct ratings: 15 amp, 250v, 60c.
Corp 2 Campion Rd New Hartford N Y
Mod N-X. (N and X separated by two numbers indicating ntrol and control circuits.) 15 amp, 250v, 60c.

E-DELAY SWITCHES

ese switches are used to provide predetermined g periods in fire-pump or combustion-control ems.

e purpose of a listed time-delay switch when used fire-pump control circuit is to prevent overheating an automatically controlled electric motor which be caused by too frequent starting. Although the ting of an electrically driven fire pump may be ated by pressure switch action, a suitable time-delay ch then takes control away from the pressure switch keeps the motor running for a predetermined time re returning control to the pressure switch.

For a combustion control circuit application, a time- y switch is normally used in conjunction with com- tion safeguard equipment to provide such features a preventilation purge period, a delay in fuel valve gnition or an oil burner motor after-run period.

ME-DELAY SWITCHES, for Fire-pump or Combustion-control Circuits

matic Timing & Controls Inc King of Prussia Pa
Series-Set, 2805, Cycle-Progress Interval Timers, 2855. 25 amp , 15 amp 230v, 2 amp 440v a-c. 1 amp 115v, 5 amp 230v d-c. Inductive.
Control Dial Timer. Type 305-B. Available with delay periods ging from 6 sec to 6 hr. Operates from 115 or 230v, 25, 50, or supply. Load contacts rated 10 amp noninductive at 115v.
ower Div Giannini Controls Corp Centerbrook Conn
Type 412. Contact ratings: 15/10 amp 125/250v a-c. Power rements 115 or 230v, 25, 50, or 60c standard. Others avail- on special request.
ole Signal Corp Moline Ill
Timeflex Timer. Type 7IA-Series. 110v, 220v, 400v. Avail- ble for all commercial frequencies. Switch capacity 10 amp 110v, amp 230v, 3 amp 440v, noninductive. Available for various ing ranges.
Timeflex Timer. Type HD. 110 or 220v, 50 or 60c. Switch acity 10 amp 110v, 5 amp 220v, noninductive. Available for ious timing ranges.
Cyd-Flex. Type HP-3. 110 or 220v, 25, 50 or 60c. Switch acity 10 amp 110v, 5 amp 220v.
Controlled Timer. Type HE Series. Available for maximum time-delay periods of 2 min, 5 min, 30 min, 60 min, 120 min, 30 hr, 60 hr. Power supply voltages 110, 220, or 440 at 25, 50, or 60c. Load-contact ratings: 10, 5, or 3 amp 110, 220, or 440v, respectively.

General Electric Co 40 Federal St Lynn Mass
Type 3T8A-18. Switch capacity 10 amp 120v, 5 amp 240v.

TIME-DELAY SWITCHES, for Combustion-control Circuits only

Adams & Westlake Co Elkhart Ind
Adlake. Types 1023, 1040, 1101, 1123. Factory-fixed time-delay periods available from 0.5 sec to 20 min. Operate on 115, 230, or 440v, 25, 50, or 60c as specified. Current-carrying capacity from 0.15 to 50 amp depending upon timing cycle and load.

Automatic Timing & Controls Inc King of Prussia Pa
Types 5601-(A through M), 5602-(A through M). 10 amp 115v, 5 amp 230v, 20, 50, or 60c noninductive. Timing ranges up to 30 minutes.

Cramer Div Giannini Controls Corp Centerbrook Conn
Type 440A. SPDT switch contacts rated 10/5 amp 125/250v a-c, 2 amp 28v d-c. Power requirements 115 or 230v, 25, 50, or 60c standard. Others available on special request.
Type 471D. Adjustable timing ranges from 15 sec to 24 hr. SPDT switch contacts rated 10/5 amp 125/250v a-c. Power requirements 115 or 230v, 25, 50, or 60c standard. Others available on special request.

Drying Systems Co Div Ther Power Tool Co 1800 Foster Av Chicago Ill
Dry-Sys Electronic Time-delay Relay. Model W. 115v 60c, 125 volt-amp inductive load capacity.

Eagle Signal Corp Moline Ill
Cycl-Flex. Type HP-3. 110 or 220v, 25, 50, or 60c. Switch capacity 10 amp 110v, or 5 amp 220v.

Elizabeth Div Elastic Stop Nut Corp of America 1627 Newark Av Elizabeth 3 N J
Agastat. Types NE-11, NE-12. Models available for operating voltages of 6-550 a-c. For retard period of not over 2 min.
Agastat. Types D(E, F or D), D(E, F or D) (T, L, H or D). Retard adjustable in five ranges from 0.08 sec. to 15 min. approx.

Industrial Timer Corp 1407 McCarter Hwy Newark 4 N J
Time-delay Timer. Series SF, CSF. 115, 220v, 50 or 60c a-c. Switch capacity 10 amp 115v, 5 amp 220v, a-c or d-c.
Time-delay Switch. Series 600. Ratings of contacts 10 amp at 115 or 230v, power supplies 115 or 230v, 60c.

Lumenite Electronics Inc 407 S Dearborn St Chicago 5 Ill
Models MR-1007, -1077, -1077-A5 (-A11, -A18, -A19), -1175, -1199, -1202, -1203A, -1333, -14, -14A, -1600, MRO-1600. Adjustable time periods from 0–15 sec to 0–2 min. Power requirements 110 or 220v, 50 or 60c. Load capacity 3/5/10 amp at 440/220/110v 60c.

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn
Series 8427B (SPDT switching), 8427C(DPDT). Contacts rated 10/5.5/5 amp at 115, 208, or 230v, 50 or 60c.

Partlow Corp 2 Campion Rd New Hartford N Y
Partlow Time-delay Relay. Model 208. Switch capacity 500 watts 110 or 220v, a-c.

Square D Co 4041 N Richards St Milwaukee 12 Wis
Class 9050. Type AO (for installation in separate enclosure), AG. Recommended delay range 0.3 sec to 1 min. Available for standard power supplies to 600v, 50 or 60c. Load rating 30/15/7.5/6 amp at 110/220/440/600v.

AIRFLOW INTERLOCKING SWITCHES, for Ventilating or Combustion Air

An airflow interlocking switch is either positive- or negative-pressure-operated and is intended to be used to shut down automatically a combustion process in the event of air supply failure.

Where hot, fume-laden air is being handled it may be difficult to keep the airflow switch clean and operative. Under such conditions, it is generally less troublesome to interlock the fan with the fuel supply by taking power for the safety-control circuit from the load side of the fan-motor starting switch. In this way, the fuel supply will be shut off unless the fan motor is powered.

Autogas Co 1100 S Twenty-fifth St Bellwood Ill

Models MP (pressure), MV (vacuum), MD (differential).

Model	*Operating range*	*Differential*	*Max pressure*
MV-S	0.1-3.0 in. w c	0.07 in. w c	1.0 psi
MP-S	0.1-3.0 in. w c	0.07 in. w c	1.0 psi
MV-S	0.8-6.0 in. w c	0.3 in. w c	1.0 psi
MP-S	0.8-6.0 in. w c	0.3 in. w c	1.0 psi
MD-SP	0.3-3.0 in. w c	0.3 in. w c	1.0 psi
MD-SP	0.8-6.0 in. w c	0.3 in. w c	1.0 psi

Cleveland Controls Inc 1111 Brookpark Rd Cleveland 9 O

Positive or negative pressure-operated switches. Operating ranges are adjustable except where noted under Remarks as fixed.

Model	*Pressure or vacuum*	*Operating range, in. w c*	*Differential, in. w c*	*Max pressure, psi*	*Remarks*
SPD-BO	P	.04-2.7 .04-6.0 1.25-3.85	.02-.07 .03-.07 .02-.07	1.0 1.0 1.0	Basic type consists of diaphragm, snap-switch with flexible wire switch leads; designed to be installed on panel boards with other control equipment
SLD-BO	V	.04-1.0	.03-.07	1.0	
SPD-B	P	.04-2.7 .04-6.0 1.25-3.85	.02-.07 .03-.07 .02-.07	1.0 1.0 1.0	Similar to above except assemblies are mounted within metal cabinet enclosures for surface mountings.
SLD-B	V	.04-1.0	.03-.07	1.0	
PD-B	P	.04-2.7 .04-6.0 1.25-3.85	.03-.07 .03-.07 .02-.07	1.0 1.0 1.0	Similar to above except has, in addition, a wiring terminal strip for attachment of external wires to switch leads.
LD-B	V	.04-1.0	.03-.07	1.0	
PDR-B	P	.04-2.7 .04-6.0 1.25-3.85	.02-.07 .03-.07 .02-.07	1.0 1.0 1.0	Same as above except has a time-delay relay, load relay for 115-230v a-c circuits and pilot-indicator lamp.
LDR-B	V	.04-1.0	.03-.07	1.0	
LD3T-A	V	.04-1.0	.03-.07	1.0	Has two time-delay relays for low-voltage circuits.
V8-A	P or V	±.04-±5.0	.02	1.0	Similar to PD-B except two pressure taps for either two positive or two negative pressure.
PSL-CO	P	.15-.25 .10-.20	0.1 0.1	1.0 1.0	Fixed operating range. Similar to SPD-BO. Horizontal and vertical mounting.
PSH-CO	P	.35-.50	0.1	1.0	Fixed operating range. Horizontal and vertical mounting.
DPSL-CO	P or V	±.20-±.20 ±.30-±.10	0.1 0.6	1.0 1.0	Fixed operating range. Horizontal and vertical mounting.
DPSH-CO	P or V	±.45-±.20 ±.50-±.33	0.6 0.8	1.0 1.0	Fixed operating range. Horizontal and vertical mounting.

Combustion Control Div Electronics Corp of America 1 Memorial Dr Cambridge 42 Mass

Models 80MA-72 (normally closed contacts), 80MB-72 (normally open contacts). Single pole, single throw contacts. Electrical ratings: 6 amp at 115v, 3 amp at 230v, 1/8 hp at 115/230v a-c or d-c. Operating range: ±1.0-±30.0 in. wc. Differential ±0.6-±1.0 in. w c. 20 psi max pressure.

Dewey Gas Furnace Co 101 E Baltimore Av

Air Flow Switch. No. 114A. Closes at ±0.22 in. w c at ±0.22 in. w c. Switch capacity 10 amp 110v, 5 amp 220v a-c or d-c.

Air Flow Switch. No. 114AF. Closes at ±0.22 in. w c opens at ±0.10 in. w c. Switch capacity 10 amp 110v, 5 amp 230v a-c or d-c.

Air Flow Switch. No. 114B. Closes at ±0.17 in. w c at ±0.10 in. w c. Switch capacity 3 amp 110v, 1.5 amp 220v or d-c.

Model Nos. D1, D2, D3. Switch capacity 10/3 amp 110/220v a-c.

Model	*Operating range*	*Differential*
D1	1.0-6.0 in. w c	⅛ psi pressure
D2	2-35 in. w c	⅛ psi pressure
D3	¾-4 psi	⅛ psi pressure

Henry G Dietz Co Inc 12-16 Astoria Blvd Long Island City

Cat No.	*Operating range*	*Differential*
116-P	0.15-1.1 in. w c	0.09-0.35 in. w c
161-P1	0.35-1.0 psi	0.10 psi
161-P1.5	0.35-1.5 psi	0.10 psi
161-P5	0.35-5.0 psi	0.10 psi

Switch capacity 15 amp 115 or 230v a-c.

Drying Systems Co Div Thor Power Tool Co 1200 Fond du Lac Av Chicago Ill

Air Flow Switch. No. 955. Switch Capacity 5/10 amp 220v a-c.

Air Flow Switch. No. 900. Switch Capacity 8/4 amp 110/220v a-c.

General Controls Co 801 Allen Av Glendale 1 Cal

Cat Nos. L-38E, L-38F. For supervising negative pressure ambient temperatures not exceeding 150°F. Switches should a level position supported by a bottom connected line having least a ¼-in. diameter vent to atmosphere. A spirit indicator provided. Vacuum connection is provided through ¼-in. iron threads on the side of the case. However, this piping should be used to support the switch. The operating range is as follows:

Type	*Operating range*	*Differential*	*Max pressure*
100	2-14 in. w c	1.2 -2.7 in. w c	20 in. w c
101	1-8 in. w c	0.5 -1.8 in. w c	10 in. w c
102	0.3-3.5 in. w c	0.17-0.5 in. w c	4 in. w c

R C Mahon Co Box 4666 Detroit 34 Mich

Air Flow Switch. Type B. Switch capacity 5 amp 110v, 2.5 amp 220v, 1.25 amp 440v a-c or d-c.

Mercoid Corp 4201 Belmont Av Chicago Ill

Vacuum Types PQ, PQP. Switch capacity 0.9 amp 24v d-c, 0.45 amp 24v d-c, 0.3 amp 115v a-c, 0.15 amp 115v d-c, 0.15 amp 230v a-c, 0.07 amp 230v d-c. PG, PG-3 are basic types with contact arrangement. Other contact arrangements are indicated by suffix figures -4, -54, -153, etc. Operating range adjustable between ±1.0 in. to ±30 in. w c; differential 0.6 in.-0.9 in. Max pressure 20 psi standard switch capacity, 6/3 amp 115/230v 60c.

Minneapolis-Honeywell Regulator Co 2753 Fourth Av S Minneapolis 8 Minn

Types C645A, C, D as tabulated:

Type	*Operating range*	*Differential*	*Max pressure*
C645A1006	2-20 in. w c	1-3 in. w c	1.5 psi
A1014*	2-20 in. w c	1-3 in. w c	1.5 psi
A1022	2-20 in. w c	1-3 in. w c	1.5 psi
A1026*	2-20 in. w c	1-3 in. w c	1.5 psi
C1004	±0.5-±5.0 in. w c	0.2-0.8 in. w c	1.5 psi
C1020	±0.5-±5.0 in. w c	0.2-0.8 in. w c	1.5 psi
C1038*	±0.5-±5.0 in. w c	0.2-0.8 in. w c	1.5 psi
D1008*	2-20 in. w c	1-3 in. w c	1.5 psi
D1011*	2-20 in. w c	1-3 in. w c	1.5 psi
D1039	2-20 in. w c	2 in. w c	1.5 psi
D1087	2-20 in. w c	1-3 in. w c	1.5 psi
D1045	2-20 in. w c	1-3 in. w c	1.5 psi

* Requires manual reset after low-pressure operation.

Pyronics Inc 17700 Miles Av Cleveland 28 O

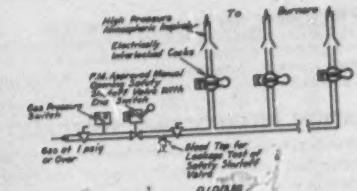
PS-R	0.1- 0.5 in. w c	*	1.0 psi
PS-W	1.0-10.0 in. w c	*	1.0 psi
PS-B	5.0-30.0 in. w c	*	1.0 psi

*Differential — approx 25% of switch operating setting; nonadjustable.

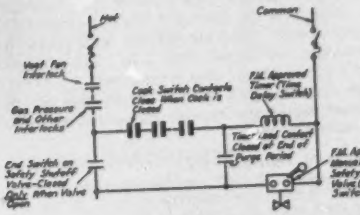
FM safety cocks and safety-control system.

FM safety cocks.

Two-dock valve, gas or air.

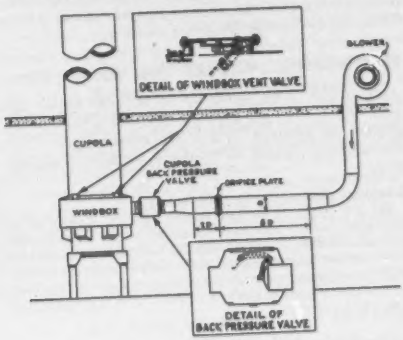


PIPING
(Multi-Burner System With High Pressure Atmospheric Inspirators)



WIRING
(Details will Vary Depending on Type of Burner Controls Used)

FM safety-control system, piping and wiring, electric interlock.



Cupola safeguards.

Retlaw Eng & Mfg Co 6607 Olmsted Av Chicago 31 Ill

Air Flow Switch. Model No. M.S. 101. Adjustable operating range —0.1 to —2 in. w c, differential less than 0.01 to 0.15 in. w c depending on setting. Switch capacity 15 amp 125/230v a-c, 125 va pilot duty.

ROTATION INTERLOCKING SWITCHES

A rotational switch is used to interlock exhaust or recirculating fans with fuel supply, electric heaters or conveyors in ovens, furnaces, or other industrial heating equipment. It is designed to be driven directly, with a suitable gear, or with a chain and sprocket drive, either from the fan-motor shaft or preferably from the fan shaft. Contacts are open when the fan is not operating, and closed when it is. The contacts open at a predetermined drop in fan speed.

When ordering give specific information as to application details and current characteristics of the safety control circuit.

Allen-Bradley Co Milwaukee 4 Wis

Rotational Switch. Bul 808. Available in ranges of 15–60, 50–200, 150–900 rpm. Speed reduction of about 5% from the actuating speed causes the contacts to open. Contacts rated 5 amp at 110, 220, 440, 550v 60c, 0.12 amp 115v d-c, 0.08 amp 230v d-c.

General Electric Co Bloomington Ill

Plugging Switch. Type CR2962. Switch capacity: makes 30 amp a-c or d-c, holds 10 amp a-c or d-c, breaks 50 amp 110v a-c, 3 amp 550v a-c, 0.5 amp 125v d-c.

FLOW-CHECK VALVES, for Gas or Air

These flow check valves are for pipe-line service and are intended to permit fluid to flow in one direction only. Normal applications involve fuel gases and air. The manufacturer should be consulted for special applications.

Eclipse Fuel Engineering Co Rockford Ill

Cat Nos. 1000 (¾ through 16 in.), 1300 (10 through 42 in. fabricated) Series. May have rubberised or plain aluminum or stainless steel disk. Max recommended back pressures range from 2 to 70 psi depending on size and disk. Special ratings are possible. 1300 Series has optional dash pot. When used, mechanism must be kept clear of possible blocking to avoid interfering with normal disk movement.

ANTISIPHON VALVES, for Fuel Oil

These valves are intended to prevent siphoning of oil onto the boiler room floor in event of breakage of piping, where the oil level in the tank is higher than the suction piping. They are spring- or weight-loaded valves and should be installed at the highest point in the fuel-oil suction piping between the storage tank and oil burner pump. The devices are approved for use where the siphon head does not exceed 10 ft, and for fuel oils which come within the specifications of the National Bureau of Standards' Commercial Standards (C.S. 12-40) for No. 3 or lighter.

Manning Maxwell & Moore Inc Bridgeport Conn

Type 1485. ⅜ through 4 in. When ordering, specify: [illegible] siphon use, type oil handled, and siphon head (distance [illegible] max oil level in tank and low point in oil piping).

FM SAFETY COCKS and Safety-contr[illegible] System, Pneumatic, for Gas

A gas cock developed by the Factory Mutual La[illegible] stories provides a positive method of preventing explosions in multi-burner gas-fired industrial furn[illegible] ovens, driers and boilers.

The types of explosions prevented are those w[illegible] can result if a burner cock is accidentally left [illegible] when the main gas supply is turned on and the[illegible] delay in applying the lighting torch. Such an int[illegible] would permit an explosive gas-air mixture to form [illegible] would be ignited when the torch is applied.

Briefly, this method of assuring closure of all indiv[illegible] burner cocks before the main burner gas safety sh[illegible] valve can be opened is a supervising cock and gas s[illegible] control system. The supervising cock is similar [illegible] usual burner cock, except that it incorporates two [illegible] outlets to furnish a small independent passage [illegible] which is open only after the main gas passage is [illegible] pletely closed. The keyway width is narrow en[illegible] with respect to the size and proportions of the [illegible] gas ports, to insure positive closure of the main ga[illegible] before opening the side outlets.

In applying these cocks to multi-burner gas s[illegible] control systems, the side ports are connected in s[illegible] with copper tubing to adjacent cocks, so that when [illegible] gas passages of all cocks are closed a new contin[illegible] passageway is provided through all the closed co[illegible] The number and locations of pressure switches, arra[illegible] ment of tubing and other details will vary with [illegible] individual installation. Our engineers should [illegible] allowed to review and advise on specific application[illegible]

The gas safety control system is adaptable to [illegible] type of burner and its air-gas mixing equipm[illegible] Combustion air, where available, is preferable to ga[illegible] use in the copper tubing (safety checking) system [illegible] the illustration, the main burner safety shutoff v[illegible] cannot be opened and remain open until all supervi[illegible] cocks are closed, combustion air pressure normal[illegible] normal gas pressure present in the pilot burner manif[illegible] Power failure, loss of combustion air, and/or gas pres[illegible] failure during normal firing will automatically clos[illegible] main burner and pilot safety shutoff valves. Once [illegible] initial safety check has been completed and the m[illegible] burner safety shutoff valve is opened, the low g[illegible] pressure switch downstream from it shunts the check[illegible] pressure switch so that, after lighting the pilots, [illegible] supervising cocks can be opened to light off.

Another different and important application of [illegible] gas safety control cock is using it to provide a m[illegible] means for making leakage tests of safety shutoff val[illegible]

cocks listed are suitable for manufactured, natural, ase, and butane gases.

ent Valve Div Rockwell Mfg Co 400 W Lexington Av ough 8 Pa

	Iron pipe size, in.	Port size, % pipe sectional area	Max rated oper. pres. psi	Copper-tubing checking system connections, tips
	½	70	50	¼
FM	2½	70	50	¼
	3	78	50	¼
FM	2½	78	50	¼
	3	55	50	¼
FM	4	60	50	¼

Schoenberger C. 6810 Harvard Av Cleveland 5 O

o. 414	½	1	¼
	¾	1	¼

e without the sliding adjustment.

Tillson Valves Detroit Controls Div American Radiator & dard Sanitary Corp Great Meadows Rd Stratford Conn

	½	10	¼
	¾	10	¼
	¾	18	¼
	¾	73	¼
	¾	73	¼
	1	83	¼
	1¼	83	¼
	1¼	86	¼
	2 *	87	¼

SAFETY COCKS and Safety-control System, Electric Interlock, for Gas or Oil

n electrically interlocking fuel cock for gas or oil developed in 1956 for application similar to that the pneumatic FM gas safety cock.

Basically, the equipment consists of a conventional ight-through cock with a built-in switch arranged the switch contacts are closed only when the cock closed.

From the fuel standpoint the cocks are installed as wn on the piping diagram; the electrical interlocking shown on the wiring diagram. Although both dia- ms are considered typical, there will be variations ending on circumstances.

For ease of operation, the ambient and fluid temper- res should be above 40°F.

ne-Coleman Company Rockford Ill

Thedeo FM Supervisory Cocks. Approved for use where the temperature does not exceed 250°F and the ambient tem- e does not exceed 125°F. Models 1280 and 1281 have threaded ections. Models 1282 and 1283 have flanged connections. gnations 3 through 12 are size indications in quarters of an

	Iron pipe size, in.	Max rated operating pressure, psi Mfd. nat. propane, butane gases	Unheated No. 3 or lighter fuel oil	Heated No. 5 or 6 fuel oil
	¾	125	125	125
1	1	125	125	125
4 or 1280-4	1¼	125	125	125
5 or 1280-5	1½	125	125	125
6 or 1280-6	2	125	125	125
8 or 1280-8	2½	125	125	125
10 or 1280-10	3	75	75	75
12 or 1280-12				

Control Div Electronics Corp of America One Memorial Dr Cambridge 42 Mass

Freye FM Supervisory Cocks. Approved for use where the perature of the fluid does not exceed 250°F and the ambient perature does not exceed 125°F. FM basic designation. Size fication in quarters of an inch 3-24. Pressure indication A, B, D, E, F, G. Flanged F. Reinpreef -R (install with switch sleeve on top). Threaded T.

	Iron pipe size, in.	Max rated operating pressure, psi Mfd. nat. propane, butane gases	Unheated No. 3 or lighter fuel oil	Heated No. 5 or 6 fuel oil
FM3CT (-R)	¾	125	125	125
FM4CT (or F) (-R)	1	125	125	125
FM5CT (or F) (-R)	1¼	125	125	125
FM6CT (or F) (-R)	1½	125	125	125
FM8CT (or F) (-R)	2	125	125	125
FM10CT (or F) (-R)	2½	75	75	75
FM12AT (or F) (-R)	3	75	75	75
FM16AF (-R)	4	75	75	75
FM24AF	6	75	100	100
FM4DF	1	100	100	100
FM6DF	1½	100	100	100
FM8DT (or F)	2	100	100	100
FM10DT (or F)	2½	100	100	100
FM12DT (or F)	3	100	100	100
FM16DF	4	100	100	100
FM3FT	¾	200	200	200
FM4FT (or F)	1	200	200	200
FM5FT	1¼	200	200	200
FM6FT (or F)	1½	200	200	200
FM8FT (or F)	2	200	200	200
FM10FT (or F)	2½	200	200	200
FM12FT (or F)	3	200	200	200
FM16FF	4	233	233	233
FM3GT	¾	233	233	233
FM4GT (or F)	1	233	233	233
FM5GT	1¼	233	233	233
FM6GT (or F)	1½	235	235	235
FM8GT (or F)	2	235	235	235

CUPOLA SAFEGUARDS

Serious explosions have occurred in cupola blower rooms, blowers and air blast piping at foundries, as a result of reverse flow and then ignition of combustible gases generated in the hot charge while the air blast was accidentally or intentionally interrupted. An important factor in many of the explosions has been the occasional failure of an otherwise careful cupola operator to take recognized precautions by opening windbox peepholes or closing the air blast gate, immediately upon blower shut-down. "Bridging" followed by sudden collapse of the cupola charge may also produce reverse flow. To afford protection against explosions, a cupola back-pressure valve should be installed in the air blast piping and one or more cupola windbox vent valves should be installed in the windbox.

The cupola windbox vent valve is a pressure operated valve located on the top of the windbox and it is held in the closed position by the air blast blower pressure inside the windbox. In the event the supply of blast air is interrupted this valve automatically opens, which affords the same protection as the operator opening peephole gates.

The cupola back-pressure valve is a lightweight check valve, which produces little pressure loss, and is located in the air blast piping between blower and windbox. The valve acts automatically to prevent possible reverse flow and accumulation of an explosive mixture of combustible gas and air, which would be subject to ignition by flashback from the hot charge.

Eclipse Fuel Engineering Co Rockford Ill

Whiting-Norwalk Cupola Windbox Vent. Model 49. For blast temperatures not exceeding 600°F.

Whiting-Norwalk Cupola Back Pressure Valves. Model 10,000. 8 through 36 in. for unheated air-blast systems.

Whiting-Norwalk Cupola Back Pressure Valves. Model 10,000-H. 8 through 36 in. for air-blast systems not exceeding 600°F.

COMBUSTION SAFEGUARDS

Combustion safeguards on automatic-lighted gas-fired boiler.

The term "combustion safeguard" refers to an electronic control device, normally used with flame sensing equipment, whose fire protection purpose is to minimize the fire and explosion hazard by supervising fuel gas and/or fuel oil flames. Factory Mutual approval primarily covers the use of combustion safeguard equipment, as applicable, on manufactured, natural and LP-gases as well as fuel oils which meet the specifications of the National Bureau of Standard's Commercial Standards C. S. 12-48 for No. 6, No. 5, No. 3, and lighter. Some equipment is applicable for use on pulverized coal burners.

Equipment listed herein can only detect the presence or absence of flame and must not be relied upon to indicate quality or completeness of combustion.

Basically, a combustion safeguard is designed to respond to accidental flame failure by automatically cutting off the fuel supply before a potentially dangerous amount of unburned fuel can accumulate. Proper application is a primary requirement for satisfactory and reliable operation and must take into consideration main and pilot burner arrangements and periodic testing and maintenance.

Approved combustion safeguards are intended to respond rapidly (4 seconds maximum) to flame failure; however, a retard (normally, 2 seconds minimum) is provided to minimize unjustified shut-downs in supervised equipment which may be the result of momentary flame flicker, for example. In addition, approved combustion safeguards are equipped with relays capable of handling any approved electric shutoff valve.

Because a given combustion safeguard is not necessarily applicable to all types of fuels and firing arrangements and, in many cases, provides complex sequence periods, the approval listings are tabulated under the main headings — for use with:

(1) **Automatic-Lighted Oil Burners.**
(2) **Automatic-Lighted Gas Burners.**
(3) **Manually-Lighted Oil and Gas Burners.**

The following definitions are included to assist correctly applying approved equipment:

An *automatic-lighted burner* is one where fuel to the main burner is turned on automatically. Prior to turning on the fuel to the main burner, the control arrangement automatically provides an electric spark (or equivalent), an electric ignited gas pilot flame or the main burner has a continuous-burning manually lighted pilot.

A *manually lighted burner* is one where fuel to the main burner can be turned on only by hand. The lighted, however, the firing rate may be automatically adjusted to high and low conditions, but not to the "off" condition.

The *trial-for-ignition period* is that period of time a programming combustion safeguard permits the main burner fuel valve to be open before main flame sensing equipment is required to detect the main flame.

Recycling is an attempt to re-establish firing conditions should flame failure occur after the trial-for-ignition period and before the end of the call-for-heat.

Safe-start: approved combustion safeguards are designed to prevent light-off if the flame responsive equipment is erroneously in the "flame on" position. However, full benefit of a "safe start" may not be realized if the electron tube is not at a proper operating temperature at the light-off time.

COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Proved (P) or Unproved (UP)	Pilot Data: Flame Failure Response Period—Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trial-for-Ignition Period—Sec.	Main Flame Data: Safety Switch (If Used)	Recycle on Flame Failure	Safe Start	Remarks
G-COLMAN	Flamotrol Model No. 1474 with Model 1266, 1266-1, 1267, 1267-1, 1268, 1268-1 or equivalent, photocell and 1266, 1266-1, 1266-2, 1266-4, 1267, 1268, 1280 or equivalent flame rod as required, 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	15 or 5–55	30	No	Yes	Transformer and pilot valve off terminal 7 for 15 sec. or terminal 6 for 5–55 sec. trial-for-ignition period. 35 sec. prepurge.
		Intermittent	Interrupted proof	10	10	15	30	No	Yes	Flame rod off terminal EF. Transformer off terminal 6 or 7. Pilot valve off terminal 8. 35 sec. prepurge.
		None	UP	—	None	10	30	No	Yes	Transformer off 6 or 7. Main valve off terminal 8. 35 sec. prepurge.
	Flamotrol Model No. 1476 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead sulphide cell, 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	15 or 5–55	30	No	Yes	Transformer and pilot valve off terminal 7 for 15 sec. or terminal 6 for 5–55 sec. trial-for-ignition period. 35 sec. prepurge. Used with 1 or 2 lead sulphide cells.
		Intermittent	Interrupted proof	10	10	15	30	No	Yes	Use 2 lead sulphide cells. Pilot cell off terminal EF. Transformer off terminal 6 or 7. Pilot valve off terminal 8. 35 sec. prepurge.
		None	UP	—	None	10	30	No	Yes	Transformer off terminal 6 or 7. Main valve off terminal 8.
	Flamotrol Model No. 1475 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead sulphide cell, 120, 208, or 240 v 50 or 60 cps.	Interrupted	P	10	10	15	30	No	Yes	Used with 1 or 2 lead sulphide cells. 35 sec. prepurge.
	Flamotrol Model No. 1476 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead sulphide cell, 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	15	30	No	Yes	Used with 1 or 2 lead sulphide cells. Adjustable extended purge period with Model NEUH11. Agastat time delay switch between terminals 12 and 17.
	Flamotrol Model No. 1477 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead-sulphide cell. 120, 208, or 240 v 50 or 60 cps.	Interrupted	P	5	5	15	30	No	Yes	Connect for 15 sec. prepurge.
		Interrupted	P	7	7	13	30	No	Yes	Connect for 25 sec. prepurge.
		None	UP	—	—	5	30	No	Yes	Transformer off terminal 6. Main valve wired to terminals 5–7 (jumpered). 15 sec. prepurge.
		None	UP	—	—	7	30	No	Yes	Transformer off terminal 9. Main valve wired to terminal 10. 25 sec. prepurge.
IGNITION CONTROL DIVISION, ELECTRONICS CORP. OF AMERICA, Memorial Drive Cambridge G, Mass.	Programming Control, Type 26RJ8 in the following Models is used with Firetron Scanner Type 48PT1; 120, 208, or 240 volts, 60 cps.									In all cases, Scanner temperature must not exceed 125° F. and it is recommended the amount of radiant energy impinging on the Scanner be limited to the minimum required for reliable operation.
	Model 6009	Interrupted	P	10	10	10	55–75	No	Yes	Ignition and pilot valve wired to terminal 5.
	Model 6009	Interrupted	P	10	10	15	55–75	No	Yes	Ignition and pilot valve wired to terminal 6.
	Model 6009	None	UP	—	0	10	55–75	No	Yes	Ignition wired to terminal 5 and jumper terminals 6 and 7.
	Model 6012	Interrupted	P	10	10	15	55–75	No	Yes	Used with either 1 or 2 Type 48PT1 Firetron Scanners. 25 sec. pre-ventilation.

INTED CLOSE TO EDGE

OIL COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Proved (P) or Unproved (UP)	Pilot Data: Flame Establishing Period—Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trial-for-Ignition Period—Sec.	Main Flame Data: Safety Switch Time (If used)	Main Flame Data: Recycle on Flame Failure	Safe Start	Remarks
COMBUSTION CONTROL DIVISION (Cont.)	Model 6010	Interrupted	P	10	10	15	55-75	No	Yes	Used with either 1 or 2 46PT1 Firebox Scanners. 65 sec. pre-ventilation.
	Model 6010	Interrupted	P	10	10	15 or 30	55-75	No	Yes	Ignition and pilot valve to terminal 5 for 15 sec. period or terminal 5 for ignition period. 65 sec. ventilation.
		None	UP	—	0	10	55-75	No	Yes	Ignition wired to terminal jumper terminals 5 and sec. pre-ventilation.
	Model CB-1	Interrupted	P	10	10	10 or 55	55-75	No	Yes	Transformer and pilot wired to terminal 5. volts, 60 cps only.
	Model CB-1	None	UP	—	0	10	55-75	No	Yes	Transformer wired to 5. Jumper terminals For 120 volts, 60 cps on
	Programming Control, Type 29RF5 in the following Models is used with Fireye Scanner Type 46PT1; 120, 208, or 240 volts, 60 cps.									
Note: Model designation of Types 26RJ5 and 29RF5 equipment may have suffix T and/or A, B or K. "T" indicates nominal 1½ sec. flame failure response time (instead of 2-4 sec.); "A" or "B" indicates special enclosure. "K" indicates surface mounted housing with key-operated lock.	Model 6000	Interrupted	P	7	7	13	55-75	No	Yes	Transformer and pilot wired to terminal 5.
	Model 6000	None	UP	—	0	7	55-75	No	Yes	For interrupted spark, former wired to terminal jumper terminals 6-7; mittent spark, transformer to terminal 6, jumper 5-7.
	Model 6015	Interrupted	P	10	10	15	55-75	No	Yes	Transformer and pilot wired to terminal 5.
	Model 6015	None	UP	—	0	5	55-75	No	Yes	Transformer wired to 5; jumper terminals 6-7.
MINNEAPOLIS-HONEYWELL REGULATOR CO., MINNEAPOLIS 8, MINN.	C7012A This is a flame detector operating in the ultra-violet spectrum; 120, 208, or 240 volts, 50 or 60 cps. It is used with the following Type R478A, R4800C or R.4898E combustion safeguards.	—	—	—	—	—	—	—	—	For pilot, main flame and data, refer to the combustion safeguard.
These types are used with Phototube Mount Type C-7003A or C-7010A and Flame Rectifier Type C-7004B, C-7011A or equivalent flame-rod holder or Type C7012A FM flame detector (see separate listing); 120, 208, or 240 volts, 50 or 60 cps.	R478A with the following suffix numbers: 1048 and 1055	Interrupted	P	15	None	15 or 60	15	No	Yes	Pilot valve wired to terminal jumper terminals 14-15 sec. (ignition period); 2 prepurge.
		Intermittent	Interrupted proof	15	None	15 or 60	15	No	Yes	Pilot valve wired to terminal jumper terminals 14-15 sec. ignition period; 2 prepurge.
		None	UP	—	None	15	15	No	Yes	Main valve wired to terminal 30 sec. prepurge.
	3, 1003, and 1071	Interrupted	P	15	None	15 or 30	15	No	Yes	Pilot valve wired to terminal jumper terminals 14-15 sec. ignition period; 2½ min. prepurge.
		Intermittent	Interrupted proof	15	None	15 or 30	15	No	Yes	Pilot valve wired to terminal jumper terminals 14-15 sec. ignition period; 1 min. prepurge.

COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Proved (P) or Unproved (UP)	Pilot Data: Flame Establishing Period—Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trial-for-Ignition Period—Sec.	Main Flame Data: Safety Switch (Timing of Valve)	Main Flame Data: Recycle on Flame Failure	Main Flame Data: Safe Start	Remarks
ELECTRIC-FLAME WELL	3, 1683 and 1671 (continued)	None	UP	—	None	15	15	No	Yes	Main valve wired to terminal 7; 1 or 2½ min. prepurge.
	R478B with the following suffix numbers: 3, 1047 and 1054	Interrupted	P	15	None	15 or 60	15	No	Yes	Pilot valve wired to terminal 5; jumper terminals 14–15 for 15 sec. ignition period; 30 sec. prepurge.
		Intermittent	Interrupted proof	15	None	15 or 60	15	No	Yes	Pilot valve wired to terminal 7; jumper terminals 14–15 for 15 sec. ignition period; 30 sec. prepurge.
		None	UP	—	None	15	15	No	Yes	Main valve wired to terminal 7; 30 sec. prepurge.
	4, 1062 and 1070	Interrupted	P	15	None	15 or 30	15	No	Yes	Pilot valve wired to terminal 5; jumper terminals 14–15 for 15 sec. ignition period; 1 or 2½ min. prepurge.
...ors are used with ... rectifier - type ... rod holder ...R, C-7011A or ...ghost and/or photo- ...7015A or equiv- ..., 120, 208 or 240 ...50 or 60 cycles.		Intermittent	Interrupted proof	15	None	15 or 30	15	No	Yes	Pilot valve wired to terminal 7; jumper terminals 14–15 for 15 sec. ignition period; 1 or 2½ min. prepurge.
		None	UP	—	None	15	15	No	Yes	Main valve wired to terminal 7; 1 or 1½ min. prepurge.
...e types are used ... a W48A Control Panel and with a C-7003A or C-7016A Phototube ...ct or Type C-7012A flame detector (see ...rate listing); 120, ...or 208 volts, 50 or ...ge. All for 2-wire ...rol.	RA890C3 C6 C7 C8 C11 C12	None None None None None None	UP UP UP UP UP UP	— — — — — —	None None None None None None	15 15 15 15 15 15	12–15 12–15 12–15 12–15 12–15 12–15	No No No No No No	Yes Yes Yes Yes Yes Yes	0.8 sec. flame response. 2–4 sec. flame response. C3 with alarm contacts N.O. C4 with alarm contacts N.O. C3 with alarm contacts N.C. C4 with alarm contacts N.C.
...e types are used with ...W48A Control Panel ...with a Type C-7003A ...C-7016A Phototube ...ct or Type C-7012A ...flame detector (see ...rate listing); 120, ...or 208 volts, 50 or ...ge. All for 2-wire con- ...rol. Do not remove ...per screw from ...base.	RA890E with the following suffix numbers: 3, 1134, 1133, 1140, 1187, 1188 and 1173	None	UP	—	None	15	15	No	Yes	0.8 sec. flame response.
	4, 1181, 1190, 1207, 1215, 1233, and 1251	None	UP	—	None	15	15	No	Yes	2–4 sec. flame response.
	7, 1348, 1355, 1363, and 1371	None	UP	—	None	15	15	No	Yes	0.8 sec. flame response, alarm contacts N.O.
	8, 1389, 1397 and 1403	None	UP	—	None	15	15	No	Yes	2–4 sec. flame response, alarm contacts N.O.
	11, 1462, 1470 and 1488	None	UP	—	None	15	15	No	Yes	0.8 sec. flame response, alarm contacts N.C.
	12, 1496, 1504, and 1512	None	UP	—	None	15	15	No	Yes	2–4 sec. flame response, alarm contacts N.C.
	817	None	UP	—	None	15	15	No	Yes	0–8 sec. flame response, moisture-fungus resistant.
...e types are used ... photocell assembly ...1A, or equivalent; ...208, or 240 volts, ...or 60 cps.	R4074B with the following suffix numbers: 2, 3, 1040, 1057	Interrupted	P	15	None	15	15	No	Yes	Pilot valve wired to terminal 5; 30 sec. prepurge.
		None	UP	—	None	15	15	No	Yes	Main valve wired to terminal 7; 10 sec. prepurge.
	1031 and 1090	Interrupted	P	30	None	15	30	No	Yes	Pilot valve wired to terminal 5; 10 sec. prepurge.

GAS COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Pyrostat (P) or Thermopile (TP)	Pilot Data: Flame-Establishing Period—Max. Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trial-for-Ignition Period—Max. Sec.	Main Flame Data: Primary Switch Timing (If used)	Main Flame Data: Recycle on Flame Failure	Main Flame Data: Safe Start	Remarks
BARBER-COLMAN CO. WHEELCO INSTRUMENTS DIV., Rockford, Ill.	Flamestrol Model No. 1474 with Model 1256, 1256-1, 1256-2, 1256-4, 1257, 1258, 1259 or equivalent flame rod. 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	5 to 15	30	No	Yes	Transformer and pilot valve terminal 7 for 15 sec. p... minal 6 if adjusted for 15... or less), trial-for-ignition p... Used with 1 or 2 flame r... 30 sec. prepurge.
		Intermittent	Interrupted proof	10	10	15	30	No	Yes	Use 2 flame rods. Pilot flame... off terminal EP. Transf... off terminal 6 or 7. Pilot v... off terminal 5. 30 sec. pre...
		Intermittent	P	10	10	None	30	No	Yes	Transformer off terminal 6... Pilot valve off terminal 5. ... prepurge.
	Flamestrol Model 1474 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead-sulphide cell. 120, 208, or 240 v 50 or 60 cps.	Interrupted	P	10	10	5 to 15	30	No	Yes	Transformer and pilot valve terminal 7 for 15 sec. v... minal 6 if adjusted for 15-... less) trial-for-ignition p... 30 sec. prepurge. Used with... 2 lead sulphide cells.
		Intermittent	Interrupted proof	10	10	15	30	No	Yes	Use 2 lead sulphide cells. ... cell off terminal EP. T... former off terminal 6 or 7. ... valve off terminal 5. 3... prepurge.
		Intermittent	P	10	10	None	30	No	Yes	Transformer off terminal 6... Pilot valve off terminal 5. ... prepurge.
	Flamestrol Model No. 1575 with Model 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent lead-sulphide cell. 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	15	30	No	Yes	Used with 1 or 2 lead ... cells. 30 sec. prepurge.
	Flamestrol Model No. 1576 with Model 1271, 1271-1, 1272, 1273, 1274, 1275, or equivalent sulphide cells. 120, 208 or 240 v 50 or 60 cps.	Interrupted	P	10	10	15	30	No	Yes	Used with 1 or 2 lead ... cells. Adjustable extended... period with Model NE... Against time delay ... between terminals 13 and 2.
	Flamestrol Model No. 1577 with lead-sulphide cell 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent. 120, 208, or 240 v, 50 or 60 cps.	Interrupted	P	5	5	15	30	No	Yes	Connect for 15 sec. prepur...
		Interrupted	P	7	7	13	30	No	Yes	Connect for 35 sec. prepur...
COMBUSTION CONTROL DIVISION, ELECTRONICS CORP. OF AMERICA, One Memorial Drive Cambridge 42, Mass.	Programming Control Type 26RJ8 in the following models is used with Firuvu Scanner Type 48PT1; 120, 208, or 240 volts, 60 cps.									In all cases, flame temp... ture must not exceed 12... and it is recommended ... amount of radiant energy ... pinging on the flame ... tind to the minimum requ... for reliable operation.
	Model 6009	Interrupted	P	10	10	10	55–75	No	Yes	Ignition and pilot valve ... to terminal 5.
	Model 6009	Interrupted	P	10	10	15	55–75	No	Yes	Ignition and pilot valve ... to terminal 6.
	Model 6012	Interrupted	P	10	10	15	55–75	No	Yes	Used with either 1 or 2 ... 48PT1 Firetron Scanner. ... 35 sec. pre-ventilation.

COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Pilot Gas Shut-off Time (Sec.)	Pilot Data: Pilot Gas Recycling Time (Sec.)	Pilot Data: Delayed Valve Opening Time (Sec.)	Main Flame Data: Trial-for-Ignition Period (Sec.)	Main Flame Data: Safety Switch Time (Sec.)	Main Flame Data: Reserve Oil Pilot Provided	Main Flame Data: Safe Start	Remarks
IGNITION CONTROL DIVISION (Cont.)	Model 6016	Interrupted	P	10	10	15	55-75	No	Yes	Used with either 1 or 2 Type 48PT1 Firetron flamnors. 65 sec. pre-ventilation.
	Model 6018	Interrupted	P	10	10	15	55-75	No	Yes	Ignition and pilot valve wired to terminal 5. 45 sec. pre-ventilation.
	Model CB-1	Interrupted	P	10	10	15	55-75	No	Yes	Transformers and pilot valve wired to terminal 5. For 120 volts, 60 cps only.
	Programming Control, Type 29RF5 in the following Models is used with Firetron flamnor Type 48PT1: 120, 208, or 240 volts, 60 cps.									
Model designation Type 29RJ6 and equipment may suffix T and/or A. X "T" indicates 15 sec. flame response time instead of 2-4 sec.); "A" or "F" indicates special features. "X" indicates flame mounted housing for top-operated knob.	Model 6009	Interrupted	P	7	7	13	55-75	No	Yes	Transformer and pilot valve wired to terminal 5.
	Model 6009	Interrupted	P	7	7	—	55-75	No	Yes	Transformer wired to terminal 5; pilot valve wired to terminal 6.
	Model 6015	Interrupted	P	10	10	15	55-75	No	Yes	Transformer and pilot valve wired to terminal 5.
MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis 8, Minn.	C7012A This is a flame detector operating in the ultra-violet spectrum; 120, 208, or 240 volts, 50 or 60 cps. It is used with the following Type RA190B, R478A, RA890C, or RA900E combustion safeguards.	—	—	—	—	—	—	—	—	For pilot, main flame and other data, refer to the associated combustion safeguard.
	RA190B with the following suffix numbers:									
	1, 27, 1155, 1193 and 1201	Intermittent	P	45	None	None	45	Yes	Yes	0.8 sec. flame response.
	3, 22, 1080 and 1078	Intermittent	P	15	None	None	15	Yes	Yes	0.8 sec. flame response.
	4, 23, 1088, and 1094	Intermittent	P	15	None	None	15	Yes	Yes	2-4 sec. flame response.
	8, 26 and 1177	Intermittent	P	15	None	None	15	Yes	Yes	0.8 sec. flame response, alarm contacts N.O.
	9, 30, 1036, 1011, 1029 and 1037	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response.
	10, 21, 1045 and 1052	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response.
	11, 24, 1102, 1110 and 1123	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response, alarm contacts N.O.
	12, 25, 1126, 1144, 1151 and 1169	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response, alarm contacts N.O.
	13	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response, moisture-fungus resistant.

GAS COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Type	Pilot Data: Period (P) Trial (T) (Sec)	Pilot Data: Flame Establishing Period (Sec)	Main Flame Data: Delayed Valve Opening (Sec)	Main Flame Data: Trial for Main Flame (Sec)	Main Flame Data: Safety Switch Time (Sec)	Main Flame Data: Controls on Pilot Failure	Main Flame Data: Gas Cock	Remarks
MINNEAPOLIS-HONEYWELL (Cont.)	R478A with the following suffix numbers:									
	1048 and 1055	Interrupted	P	15	None	15	15	No	Yes	Pilot valve wired to terminals 14-15; 30 s purge.
		Intermittent	P	15	None	None	15	No	Yes	Pilot valve wired to terminals 14-15; 30 s purge.
These types are used with Flame Rectifier Type C-7004B, C-7011A or equivalent flame-rod holder or Type C7012A FM flame detector (see separate listing); 120, 208, or 240 volts, 50 or 60 cps.	1062 and 1071	Interrupted	P	15	None	15	15	No	Yes	Pilot valve wired to terminals 14-15; 1 or 2½ min. purge.
		Intermittent	P	15	None	None	15	No	Yes	Pilot valve wired to terminals 14-15; 1 or 2½ min. purge.
	R478B with the following suffix numbers:									
	1047 and 1054	Interrupted	P	15	None	15	15	No	Yes	Pilot valve wired to terminals 14-15; 30 sec. purge.
		Intermittent	P	15	None	None	15	No	Yes	Pilot valve wired to terminals 14-15; 30 sec. purge.
	1062 and 1070	Interrupted	P	15	None	15	15	No	Yes	Pilot valve wired to terminals 14-15; 1 or 2½ min. purge.
These types are used with Flame Rectifier Type C-7004B, C-7011A or equivalent flame rod holder and/or Type C7012A or equivalent photocell; 120, 208, or 240 volts, 50 or 60 cycles		Intermittent	P	15	None	None	15	No	Yes	Pilot valve wired to terminals 14-15; 1 or 2½ min. purge.
	RA800B1	Intermittent	P	15	None	None	12-15	Yes	Yes	0.8 sec. flame response.
	B4	Intermittent	P	15	None	None	12-15	Yes	Yes	2-4 sec. flame response.
	B6	Intermittent	P	45	None	None	35-45	Yes	Yes	2-4 sec. flame response — 3[illegible] contacts N.O.
	B8	Intermittent	P	15	None	None	12-15	Yes	Yes	B6 with alarm contacts N.
These types operate at 120, 208, or 240 volts, 50 or 60 cps., and are used with Flame Rectifier Unit Type C-7004B, C-7011A or equivalent flame-rod holder. These combustion safeguards may also be used with the flame-radiation frequency-response adapter (flame-sensing equipment) consisting of Type C-6076A (control) and Type C7012A or equivalent photocell at 120, 208, or 240 volts, 50 or 60 cps. All are for 3-wire control and has terminal base.	B9	Intermittent	P	15	None	None	12-15	Yes	Yes	B4 with alarm contacts N.
	B13	Intermittent	P	15	None	None	12-15	Yes	Yes	B3 with alarm contacts N.
	B14	Intermittent	P	15	None	None	12-15	Yes	Yes	B4 with alarm contacts N.
	B15	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response.
	B16	Intermittent	P	90	None	None	30	Yes	Yes	2-4 sec. flame response.
	B17	Intermittent	P	30	None	None	30	Yes	Yes	B15 with alarm contacts N.
	B18	Intermittent	P	30	None	None	30	Yes	Yes	B16 with alarm contacts N.
	B19	Intermittent	P	30	None	None	30	Yes	Yes	B15 with alarm contacts N.
	B20	Intermittent	P	30	None	None	30	Yes	Yes	B16 with alarm contacts N.
	B21	Intermittent	P	45	None	None	35-45	Yes	Yes	2-4 sec. flame response, [illegible] Fungus resistant.

COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Proved (P) or Unproved (U)	Pilot Data: Flame Establishing Period—Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trial-for-Ignition Period—Sec.	Main Flame Data: Safety Switch Time (Maximum)	Restarts on Flame Failure	Safe Start	Remarks
HONEYWELL REGULATOR CO. (Minneapolis, Minn.)	R4800C3	Intermittent	P	15	None	None	12-18	Yes	Yes	0.8 sec. flame response.
	C4	Intermittent	P	15	None	None	12-18	Yes	Yes	2-4 sec. flame response.
	C5	Intermittent	P	45	None	None	35-55	Yes	Yes	2-4 sec. flame response, alarm contacts N.O.
	C7	Intermittent	P	15	None	None	12-18	Yes	Yes	C3 with alarm contacts N.O.
	C8	Intermittent	P	15	None	None	12-18	Yes	Yes	C4 with alarm contacts N.O
	C11	Intermittent	P	15	None	None	12-18	Yes	Yes	C3 with alarm contacts N.C.
	C12	Intermittent	P	15	None	None	12-18	Yes	Yes	C4 with alarm contacts N.C.
	C14	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response, alarm contacts N.O., moisture-fungus resistant.
	C15	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response.
	C16	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response.
	C17	Intermittent	P	30	None	None	30	Yes	Yes	C15 with alarm contacts N.O.
	C18	Intermittent	P	30	None	None	30	Yes	Yes	C16 with alarm contacts N.O.
	C19	Intermittent	P	30	None	None	30	Yes	Yes	C15 with alarm contacts N.C.
	C20	Intermittent	P	30	None	None	30	Yes	Yes	C16 with alarm contacts N.C.
	R4800E with the following suffix numbers: 1, 1009, 1017, 1025, 1033, 1041 and 1096	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response.
	2, 1066, 1074, 1082, 1090, 1105 and 1116	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response.
	3, 1134, 1132, 1140, 1157, 1165 and 1173	Intermittent	P	15	None	None	15	Yes	Yes	0.8 sec. flame response.
	4, 1151, 1199, 1207, 1215, 1223 and 1231	Intermittent	P	15	None	None	15	Yes	Yes	2-4 sec. flame response.
	5, 1240, 1248, 1264, 1272	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response, alarm contacts N.O.
	6, 1280, 1296, 1306, 1314, 1322 and 1330	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response alarm contacts N.O.
	7, 1349, 1355, 1463 and 1371	Intermittent	P	15	None	None	15	Yes	Yes	0.8 sec. flame response alarm contacts N.O.
	8, 1389, 1397 and 1405	Intermittent	P	15	None	None	15	Yes	Yes	2-4 sec. flame response alarm contacts N.O.
	9, 1413, 1421 and 1439	Intermittent	P	30	None	None	30	Yes	Yes	0.8 sec. flame response alarm contacts N.C.
	10, 1447 and 1464	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response alarm contacts N.C.
	11, 1462, 1470 and 1488	Intermittent	P	15	None	None	15	Yes	Yes	0.8 sec. flame response alarm contacts N.C.
	12, 1496, 1504 and 1512	Intermittent	P	15	None	None	15	Yes	Yes	2-4 sec. flame response alarm contacts N.C.
	13, 1520 and 1538	Intermittent	P	45	None	None	45	Yes	Yes	2-4 sec. flame response alarm contacts N.O.

GAS COMBUSTION SAFEGUARDS, AUTOMATIC-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Pilot Data: Type	Pilot Data: Proved (P) or Unproved (UP)	Pilot Data: Flame Establishing Period—Sec.	Main Flame Data: Delayed Valve Opening—Sec.	Main Flame Data: Trials-for-Ignition Period—Sec.	Main Flame Data: Safety Switch Timing (If Used)	Main Flame Data: Recycle on Flame Failure	Main Flame Data: Gas Shut	Remarks
MINNEAPOLIS-HONEYWELL (Cont.)	815	Intermittent	P	45	None	None	45	Yes	Yes	2-4 sec. flame response, fungus resistant.
	816	Intermittent	P	30	None	None	30	Yes	Yes	2-4 sec. flame response, contacts H.O. moisture resistant.
These types operate at 120, 208, or 240 volts, 50 or 60 cycles, and are used with Flame Rectifier Unit C-7004B or equivalent flame rod holder. These combustion safeguards (with jumper screw) may also be used with Type C-7012A flame detector (see separate listing) or with the flame radiation frequency response adapter (flame sensing equipment) consisting of Type C-7008A (control) and Type C7013A or equivalent photocell at 120, 208, or 240 volts, 50 or 60 cps. All for 2-wire control line terminal base.	817	Intermittent	P	15	None	None	15	Yes	Yes	0.5 sec. flame response, fungus resistant.
	R4074B with the following suffix numbers:									
	1040 and 1057	Interrupted	P	15	None	15	15	No	Yes	Pilot valve timed to remain open 30 sec. prepurge.
		Intermittent	P	15	None	None	15	No	Yes	Pilot valve timed to remain open 30 sec. prepurge.
These types are used with Type C7012A or equivalent photocell 120, 208, or 240 volts, 50 or 60 cps.		Interrupted	P	30	None	15	30	No	Yes	Pilot valve timed to remain open 10 sec. prepurge.
		Intermittent	P	30	None	None	30	No	Yes	Pilot valve timed to remain open 10 sec. prepurge.
MINNEAPOLIS-HONEYWELL REGULATOR CO., BROWN INSTRUMENT DIVISION, Minneapolis 8, Minn.	C7012A This is a flame detector operating in the ultraviolet spectrum. It is used with the following Type W-124A and W-124B combustion safeguards; 120, 208 or 240 volts, 50 or 60 cps.	—	—	—	—	—	—	—	—	For pilot, main flame and data, refer to the combustion safeguard.
	Honeywell Protectoglo Type W-124A with the following suffix numbers:									
	8, 14, 1009, 1017, 1041 and 1058	Intermittent	P	45-60	None	None	45-60	Yes	Yes	
	12, 18, 1024, 1033, 1068 and 1074	Intermittent	P	9-15	None	None	9-15	Yes	Yes	
With Flame Rectifier Unit Type C-7004B or equivalent flame-rod holder or Type C-7012A flame detector (see separate listing). 120, 208, or 240 volts. 50 or 60 cps. 14, 18, 1041, 1058, 1068 and 1074 are chassis only.										
	Honeywell Protectoglo Type W-124B with the following suffix numbers:									
	12, 14, 18, 1008, 1018, 1040, 1057 and 1073	Intermittent	P	45-60	None	None	9-15	Yes	Yes	
	13, 18, 1024, 1032 and 1065	Intermittent	P	9-15	None	None	9-15	Yes	Yes	
With Flame Rectifier Unit Type C-7004B or equivalent flame-rod holder or Type C-7012A flame detector (see separate listing). Provides 3-15 minute prepurge period. 120, 208, 240 volts. 50 or 60 cps. 14, 18, 1040, 1057, and 1065 are chassis only.										

L & GAS COMBUSTION SAFEGUARDS, MANUAL-LIGHTED BURNERS

Manufacturer	Designation and Power Supply	Fuel	Safe Start	Trial-For-Ign. Auto. Ltd.	Prepurge	Remarks
ER-COLEMAN	Flametrol Model No. 1300	Gas	Yes*	No	No	For multi-burner protection. Requires Models 1300-1 or 1300-2 for master unit.
ELD STRUMENTS DIV., ded, Ill.	Flametrol Model No. 1300-1	Gas or Oil	Yes	No	Yes	30 sec. prepurge timing.
	Flametrol Model No. 1300-2	Gas or Oil	Yes	No	Yes	60 sec. prepurge timing.
	Flametrol Model No. 1470	Gas	Yes	No	Yes	45 sec. prepurge; external push-button required.
	Flametrol Model No. 1472	Gas or Oil	Yes	Yes	Yes	2½-15 minute adjustable prepurge. Initial and repeat purge.
	Flametrol Model No. 1475	Gas or Oil	Yes	Yes	Yes	30 sec. prepurge. With Model 1472 as master unit, can be used for multi-burner protection.
	For gas supervision, the above 1300 series use Models 1256, 1256-1, 1257, 1256, 1230 or equivalent flame rods. The above 1400 series use Models 1256, 1256-1, 1256-3, 1256-4, 1257, 1256, 1230 or equivalent flame rods. For oil supervision, all above units use Models 1266, 1266-1, 1267, 1267-1, 1268, 1268-1 or equivalent photocells. 1300 series and Model 1470 are 120, 208 or 240 V 25 or 50/60 cps. 1472 and 1473 Models are 120, 208 or 240 v 50/60 cps.					
	Flametrol Model No. 1570	Gas or Oil	Yes	No	Yes	45 sec. prepurge; external push-button required. Arrange for spark ignition of oil.
	Flametrol Model No. 1572	Gas or Oil	Yes	Yes	Yes	2½-15 minute adjustable prepurge. Initial and repeat purge.
	Flametrol Model No. 1573	Gas or Oil	Yes	Yes	Yes	30 sec. prepurge. With Model 1572 as master unit can be used for multi-burner protection.
	For gas or oil supervision the above 1500 series use Models 1271, 1271-1, 1272, 1273, 1274, 1275 or equivalent cells. 120, 208 or 240 v 50/60 cps.					
	* After initial powering, electron tube must be at proper operating temperature before start of programming sequence.					
BUSTION CONTROL TRON, ELECTRONICS P. OF AMERICA ne Memorial Drive mbridge 42, Mass.	Type 266J5 in the following models used with Fireye scanner 45PT1. 120, 208, or 240 volts, 60 cps.					Scanner temperature should not exceed 125°F.
	Model 6000	Gas or Oil	Yes*	No	No	
	Model 6060	Gas or Oil	Yes*	No	No	
	Model 6065	Gas or Oil	Yes*	No	No	Flame rod 69ND1 or equivalent may be wired to terminal 13.
	Model designation may include suffix T and/or A, B or K. "T" indicates nominal 1¼ sec. flame failure response time (instead of 2–4 sec.); "A" or "B" indicates special enclosure. "K" indicates surface mounted housing with key operated lock.					
	* After initial powering, electron tube must be at proper operating temperature before start of programming sequence.					
YING SYSTEMS CO., Div. of Tate Power Tool Co., 1800 Foster ve., Chicago, Ill.	Dry-Eye Model Q Safety Control with Model Q Flame Detector and Model W Electronic Time Delay Relay; 115 volts, 60 cps.	Gas	No	No	Yes	Provides protection for 1 to 18 burners — sometimes more.
NNEAPOLIS-NEYWELL GULATOR CO., Minneapolis 8, Minn.	C7012A This is a flame detector operating in the ultraviolet spectrum. It is used with the following Type RA190B, RA890C, R-488A and RA890E combustion safeguards: 120, 208 or 240 volts, 50 or 60 cps.	—	—	—	—	For fuel, safe start and other data, refer to the associated combustion safeguard.
	RA190B, RA890B, RA890C and RA890E listed under "Automatic Lighted Burners — Gas," can be arranged for manually lighted gas or oil burners. See Remarks.					External manual operating control necessary. Arrange for non-recycle of ignition and oil fuel.
	Type R-488A Used with flame-rod holder Type C-7004B or photocell-mount Type C-7003A or equivalent. 120, 208, or 240 volts, 50 or 60 cps. May also be used with the flame-radiation frequency-response adapter (flame-sensing equipment) consisting of Type C-7006A (control) and Type C7013A or equivalent photocell.	Gas or Oil	Yes	No	No	Main valve wired to terminal 7 (gas fired with intermittent gas pilot) or to terminal 4 (oil fired, spark ignited). Equipment normally used with external operating control Type R445A.
	The foregoing types, except Type RA890B may be used with the Type C-7012A flame detector (see separate listing)					

OIL & GAS COMBUSTION SAFEGUARDS, MANUAL-LIGHTED BURNERS — Continued

Manufacturer	Designation and Power Supply	Fuel	Safe Start	Trial-For-Ign. Auto. Ltd.	Prepurge	Remarks
MINNEAPOLIS-HONEYWELL (Cont.)	Protectorelay Type R4078A with Flame Rectifier Unit Type C-7004B, C-7011A or equivalent flame-rod holder; at 120, 208 or 240 volts, 50 or 60 cps.	Gas	**	No	No	External Type 3045A tra... step-start station or equiva... necessary. Provides compon... continuously during firing per...
	** After the manual push button is released, flame failure or an unsafe failure in the electronic flame-sensing circuit causes shut-down within 4 sec. The self-checking ... circuit feature is unique; and particularly advantageous on continuous firing equipment where a potentially unsafe condition could otherwise exist for a long per...					
	Protectorelay Type R4078A with safe-start adapter and ultra-violet sensitive flame detector C7012A; at 120, 208, or 240 volts, 50 or 60 cps.	Gas	Yes	No	No	Requires external-type tra... step-start station Q-307A or e... lent. Provides component che... tinuously during firing period.
	Honeywell Multiburner Controls Types IDO12A and IDO13B	Gas	Yes	No	Yes	Sequence pilot ignition, individu...
	IDO12C and IDO12D	Gas	Yes	No	No	supervision, unison main burner ... off; purge period (IDO12A, -B ad... able to 5½ min.
	Types IDO13A and IDO13B	Gas	Yes	No	Yes	Unison pilot ignition, individu...
	IDO13C and IDO13D	Gas	Yes	No	No	supervision, unison main burner ... off; purge period (IDO13A, -B ad... able to 5½ min.
These devices use Flame Rectifier Unit Types C-7004B, C-7011A or equivalent flame-rod holders; 120, 208, or 240 volts, 50 or 60 cps.	Types IDO22A and IDO22B	Gas	Yes	No	Yes	Individual control of each b...
	IDO22C and IDO22D	Gas	Yes	No	No	purge period (IDO22A and ID... adjustable to 5½ min.
	Type ID1214A2	Gas	Yes	No	Yes	For two burners; individual ... ignition and supervision; unison ... burner lightoff; purge period adjus... to 5½ minutes. External push b... required.
MINNEAPOLIS-HONEYWELL REGULATOR CO., BROWN INSTRUMENT DIVISION, Minneapolis 8, Minn.	Honeywell Control Type ID1214A1 with Flame Rectifier Unit Type C-7004B, C-7011A or equivalent flame-rod holder; 120, 208 or 240 volts; 50 or 60 cps.	Gas	Yes	No	Yes	Purge period adjustable to 5½ m... External push buttons required.
	C7012A This is a flame detector operating in the ultraviolet spectrum. It is used with the following Type W-124A, W-124B, IDO51A and IDO51B combustion safeguards; 120, 208 or 240 volts, 50 or 60 cps.	—	—	—	—	For fuel, safe start and other ... refer to the associated combu... safeguard.
	Honeywell Protectoglo Type W-124A with the following suffix numbers: 8, 12, 14, 15, 1009, 1017, 1035, 1039, 1041, 1046, 1066, and 1074	Gas or Oil	Yes	Yes	No	External manual operating co... necessary; arrange for no recycle.
	Honeywell Protectoglo Type W-124B with the following suffix numbers: 12, 13, 14, 15, 16, 1008, 1016, 1024, 1032, 1040, 1057, 1065, and 1073.	Gas or Oil	Yes	Yes	Yes	External manual operating co... necessary; arrange for no recycle.
	Honeywell Protectoglo Type IDO51A	Gas or Oil	Yes	Yes	No	
	Honeywell Protectoglo Type IDO51B	Gas or Oil	Yes	Yes	Yes	
	The above devices use a Flame Rectifier Unit Type C-7004B, C-7011A or equivalent flame-rod holder for gas and a Photo-tube Mount Type C-7003A or C-7010A for oil applications. They may also be used with the Type C-7012A flame detector (see separate listing). 120, 208, or 240 volts, 50 or 60 cps.					
PROTECTION CONTROLS, INC., 7317 N. Lawndale Ave. Skokie, Illinois	Protectofier Form 5805 and 5805F single or multiburner controls; 115 volts, 60 cps.	Gas	Yes	No	No	External manual operating co... necessary; arrange for no recycle; in... mittent or interrupted pilot (s); int... pilot ignition; individual pilot su... vision; unison main burner ligh... individual burner supervision.

S COMBUSTION SAFEGUARDS, Combustion-gas-analyzer Type, for Manual-lighted Burners

is equipment is intended primarily for use on ually lighted, gas-fired industrial heating equipment as large power boilers, heat treating furnaces, and . (Size — capacity in lbs. of steam per hr. — and of burner do not affect application). It is designed mple continuously the gaseous products of combus- and to indicate and record percent combustibles and ent oxygen (optional) present in the sampled gases. important that sample point(s) be located so that mple to the gas analyzer accurately represents the flue gas or atmosphere passing that particular sec- and to respond to gas concentration changes at the ers as promptly as possible. Temperatures at the pling point should not exceed 1200°F.

he "percent combustibles" indication may be con- ed the safety control function of the equipment. ng a firing cycle, a dangerous condition may result, example, from a deficiency of air; however, such a umstance normally would cause a gradual increase in amount of combustibles in the products of incom- e combustion. The equipment is designed to provide utomatic warning signal at 1% and a danger signal 2% combustibles. Provision is made for shutting off fuel supply at the 2% point. (The 2% value is well ow the danger level regardless of the type fuel gas.) ilarly, this equipment may be used to detect a dan- ous internal atmosphere at the time of burner light-off. The "percent oxygen" indication, when employed, is ended to provide the operator with information on ich to judge the efficiency of combustion. This is a y desirable characteristic from the economic stand- nt particularly when applied to large power boilers. automatic signal indication is required for the gen analysis.

This equipment usually consists of a Sampling System, Analyzer and Recorder. It is not instantaneous in response to composition changes of the monitored gases. From the pick-up point, the sample gas travels through tubing which may be 25 ft. long. After reaching the actual analyzing equipment, the gas is passed through a catalytic combustion chamber. A change in gas composition causes a change in electrical characteristics of a Wheatstone bridge circuit which is automatically compensated by mechanical movement of a slide wire resistor. This motion not only results in a continuous recording of conditions but also results in snap switch actuation for signaling purposes if the specified 1 and 2% limits are reached. It is recognized that this series of operations involves a time delay which may be in the order of 10–20 seconds depending somewhat on the concentration of combustibles in the sample. However, because unsafe combustion is usually the result of gradual changes in conditions, the speed of response in a well engineered system can be sufficiently fast, and with sufficient safety factor to warn of danger except for a sudden loss of flame. The good judgment of well trained operators is a necessary element, especially while the combustion chamber is heating up.

In order to derive the full benefits of the equipment, each application must be individually engineered and inspected by the manufacturer of the device or an authorized representative. It is expected that such engineering will also require the cooperation of the manufacturer of the associated gas firing equipment. The Factory Mutual Engineering Division should be consulted and preliminary drawings submitted to them for review and recommendations before proceeding with an installation.

Bailey Meter Co 1050 Ivanhoe Rd Cleveland 10 O

Bailey Combustibles and Oxygen Analyzer. Types OC1530, OC1540, OC1550. Furnished with Recorder Types W835, WM55A or W8357 and Sampling System B/M66129.

Bailey Combustibles Analyzer. Type OB1560. Furnished with Recorder Types W835 or W8357 and Sampling System B/M66129.

OIL SAFETY SHUTOFF VALVES

A self-closing safety shutoff valve is one of the important protection devices used to safeguard oil-fired equipment such as boilers, furnaces, ovens and dryers, from fire and explosion hazards in the "lighting-off" and "firing" operations. It is usually considered the "key" safety device because the protection provided by other safety devices, such as combustion safeguards, gas safety control cocks, and time-delay, pressure and excess temperature limit switches, depends on this valve to shut off the fuel supply in the event of unsafe conditions.

There are two basic types of these valves, "Manual Opening" or "Automatic Opening." A safety shutoff valve in operation is held open either by electric energy or by pressure (oil, gas, air or atomixing medium) or by both. It is self-closing by means of a spring and/or dead weight within five seconds after the holding medium (electricity, pressure or both) is cut off. It can be opened, either manually or automatically, only after the holding medium is applied. The valve is suitably enclosed, and it cannot be readily by-passed or blocked in the open position. In the case of the manually opened valves, blocking the handle does not prevent closing when the holding medium is cut off.

Factory Mutual approval covers the use of fuel-oil valves for either heated or unheated fuel oils as specified by the National Bureau of Standards' Commercial Standards (CS. 12–40). Valves of the automatic opening type approved for heavy fuel oil should not be opened unless the oil is preheated. As applicable, approval tests include fluid temperatures to 250°F, although some valves may be suitable for higher temperatures.

Both manual and automatic opening safety shutoff valves are available for use in safety control arrangements of either electrical or pressure (non-electrical) type.

Strainers, at present not subject to approval, are often advisable in the inlet piping as close as practicable to the valves to remove foreign particles which might interfere with their safe operation.

When ordering, specify the actual condition for each of the items in the tables below. Also, as applicable, specify voltage and frequency of power supply, maximum pressures to be encountered, desired opening and closing pressures, and any unusual temperature, corrosive or dusty atmospheric conditions. Valve applications handling liquids other than the specified fuel-oils or under unusual conditions should be referred to the Factory Mutual Engineering Division.

OIL SAFETY SHUTOFF VALVES, Manual Opening, Electric Holding

Combustion Control Div Electronics Corp of America 1 Main Dr Cambridge 42 Mass

	Iron-pipe size, in.	Port size, in.	Max rated cap. pounds per hour: Unheated No. 6 oil or lighter	Heated No. 6 oil
Model 81GF4	1	Full	300	300
81GF5	1¼	Full	300	300

Class B Trim: cast-iron alloy body and disc, stainless-steel seat, brass and bushing.

General Controls Co 801 Allen Av Glendale Cal

V-110C38DL2	¾	1	400	
V-110C38EL2	¾	1	300	400
V-110C38FL2	1	1	400	400
V-110C38GL2	1¼	1¼	275	275
V-110C38HL2	1½	1½	300	300
V-110B38HL2	1½	1½	200	300
V-110C38JL2	2	2	110	200
V-110A38JL2	2	2	110	110
V-110C38KL2	2½	2½	75	110
V-110A38KL2	2½	2½	75	75
V-110C38LL2	3	3	50	75
V-110A38LL2	3	3	50	50
V-110A38NL2	4	4	50	50
V-110A38QL2	6	6	15	50
V-110F42FL2	1	1	400	15
V-110K42FL2	1	1	400	400
V-110F42GL2	1¼	1¼	275	400
V-110H42GL2	1¼	1¼	275	275
V-110F42HL2	1½	1½	200	275
V-110H42HL2	1½	1½	200	300
V-110F42JL2	2	2	110	200
V-110C42JL2	2	2	110	110
V-110C42KL2	2½	2½	75	110
V-110C42LL2	3	3	50	75
V-110E62FA2	1	1¼	85	50
V-110E62GA2	1¼	1¼	85	85
V-110E62HA2	1½	2	35	85
V-110E62JA2	2	2½	15	35
V-110E62KA2	2½	3	15	15
V-110E62LA2	3	3½	15	15
V-110F62NA2	4	5	10	15
V-110F62PA2	5	6	5	10
V-110F62QA2	6	6	5	5
Type V-115*				
Cat. Nos. V115AE415M	¾	1	300	300
V115AF415M	1	1	300	300
V115AG415M	1¼	1¼	300	300
Type K-29F	¾	5/32	15	
	¼	5/32	15	

Catalog numbers are for 115 v 60 c valves with handwheel type reset standard disk and no accessories. For other voltages, alternate reset action accessories, consult the manufacturer.

* Operator assemblies available with or without one or two auxiliary Snap-Switches for alarm signaling by horn or lamp.

Maxon Premix Burner Co Muncie Ind

Series 600* and Series 600-DP ("dust proof" enclosure)	1	Full	125
"Gold Band" Trim B***	1¼	"	100
	1½	"	70

	Iron-pipe size, in.	Port size, in.	Max rated opig pressure, psi: Unheated No. 3 oil or lighter	Heated No. 4 or No. 6 oil	Max fluid temp
...and Series 709-DP 1M**		Full	200	200	250
...ional" cushioned					
...ard" Trims A & B***	1¼M**	"	200	200	250
	⅜ & ½	11/16 dia.	125		125
	¾	31/32 dia.	100		125
	1¼	1¼ dia.	70		125
	1½	1-7/16 dia.	70		125
	2	1-11/16 x 1-7/16	40		125
	2½	2¾ x 1-7/16	20		125
	3				

* Handwheel and chain (for locations in overhead lines) and/or type MS Signal Switch Assembly (to operate horn or flasher when valve closes) available as optional extras.

** Indicate medium pressure model.

*** Class A Trim — Cast iron alloy body, disc and seat, bronze stem and bushing for unheated No. 3 or lighter fuel oils.

Class B Trim — Cast iron alloy body and disc, stainless steel seat, bronze stem and bushing for both unheated No. 3 or lighter and heated No. 5 or No. 6 fuel oils.

American Mfg Co 4455 E 71st St Cleveland 5 O

...22, 23C, 23K†, 23W, ...23C, 23SK†, 23SW	¾	Full	150	150	200
M-S	1 *	"	150	150	200
M-S	1¼	"	150	150	200
M-S	1½	"	125	125	200
M-S	2	"	100	100	200
M-S	2½	"	80		
M-S	3	"	40		

* Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes), and/or companion flanges (to provide threaded connections for flanged 2½ and 3 in. valves) available as optional extras.

† 2-in. IPS max.

...-Klugmann Mfg Co Salem Mass

...d	1	Full	600	600	350
	1¼	"	600	600	350
	1½	"	600	600	350
	2	"	400	400	250
	2½	"	300	300	250
	3	"	200	200	250
	4	"	150	150	250
	5	"			
	1	Full	150	150	250
...d	1¼	"	150	150	250
	1½	"	125	125	250
	2	"	100	100	250
	2½	"	60	60	250

...ers Products Inc New Castle Ind

...in EG-1 (ten switch), FG-1S (SPDT switch), FG-1D (DPDT switch).

...n L	1	Full	150	—	—
	1¼	1	150	—	—
	1½	1	150	—	—
...n MO	1	Full	150	150	200
	1¼	1	150	150	200
	1½	1	150	150	200
	4	Full	25	—	120
...n O	6	"	15	—	120

... Trim L — Ductile iron disc, iron seat, brass stem and bushing.
... Trim MO — Ductile iron disc, stem and bushing, iron seat.
... Trim O — Ductile iron disc, stainless steel stem, cast iron seat.

...L SAFETY SHUTOFF VALVES, Manual Opening, Pressure Holding

...h American Mfg Co 4455 E 71st St Cleveland 5 O

...**22, 23C, 23K†, 23W	¾	Full	150	150	200
...M-(D or E)*	1	"	150	150	200
...M-(D or E)*	1¼	"	150	150	200
...M-(D or E)*	1½	"	125	125	200
...M-(D or E)*	2	"	100	100	200
...M-(D or E)*	2½	"	80		
...M-(D or E)*	3	"	40		

...D denotes diaphragm for air or gas (max. rated press. 5 psi, approx. trip press. 1 in. WC). H denotes diaphragm for air, gas, or oil (max. rated press. 150 psi, approx. trip press. 3 psi).

** Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes), and/or companion flanges (to provide threaded connections for flanged 2½ and 3 in. valves) available as optional extras.

† 2-in. IPS max.

OIL SAFETY SHUTOFF VALVES, Manual Opening, Duplex Pressure Holding

North American Mfg Co 4455 E 71st St Cleveland 5 O

	Iron-pipe size, in.	Port size, in.	Max rated opig pressure, psi: Unheated No. 3 oil or lighter	Heated No. 4 or No. 6 oil	Max fluid temp
Series** 23, 23C, 23K†, 23W					
0-M-(D or J)*	¾	Full	150	150	200
1-M-(D or J)*	1	"	150	150	200
2-M-(D or J)*	1¼	"	150	150	200
3-M-(D or J)*	1½	"	125	125	200
4-M-(D or J)*	2	"	100	100	200
5-M-(D or J)*	2½	"	80		
6-M-(D or J)*	3	"	40		

* D denotes one diaphragm for air or gas (m...r. rated press. 5 psi, approx. trip press. 3 in. WC), and the other for air, gas, or oil (max. rated press. 150 psi, approx. trip press. 4 psi). J denotes both diaphragms for air or gas (max. rated press. 5 psi, approx. trip press. 3 in. WC).

** Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes) and/or companion flanges (to provide threaded connections for flanged 2½ and 3 in. valves) available as optional extras.

† 2-in. IPS max.

OIL SAFETY SHUTOFF VALVES, Automatic Opening, Electric Opening and Holding

American Standard Controls Div 5900 Trumbull Av Detroit 8 Mich

Detroit Type 7 No. 668-7	⅜	¼	200
	⅜	3/16	120
	⅜	7/32	90

Automatic Switch Co Florham Park N J

	Iron-pipe size, in.	Port size, in.	Max rated opig pressure, psi: Unheated No. 3 oil or lighter	Heated No. 4 or No. 6 oil	Max fluid temp
Bulletin Nos. 8030A* and 8031A*					
Cat. Nos. 8030 (or 1) A1	¾	½	7		
8030 (or 1) A41	¾	½	15		
8030 (or 1) A2	½	Full	7		
8030 (or 1) A42	½	"	15		

Note: "8031" series has explosionproof enclosure.

Bulletin No. 8261*				
Cat. Nos. 82612	¾	3/32	75	120
T82612	¾	3/32	75	120
LM82612	¾	3/32	75	120
82613	¾	7/64	60	120
T82613	¾	7/64	60	120
LM82613	¾	7/64	60	120
Bulletin No. 8262*				
In the following Cat. Nos. only				
Cat. Nos. 82621 and 82631M**	¾	1/16	300	
82622 and 82622M**	¾	⅛	120	
82623 and 82623M**	¾	5/32	90	
82624 and 82624M**	¾	3/16	60	
82625 and 82625M**	¾	1/16	300	
82626 and 82626M**	¾	⅛	120	
82627 and 82627M**	¾	5/32	90	
82628 and 82628M**	¾	3/16	60	
Bulletin Nos.				
8263*	¾ or ⅝	⅛	55	120
T8263*	¾ or ⅝	⅛	100	120
LM8263*	¾ or ⅝	⅛	125	120
	¾ or ⅝	⅛	225	120
	¾ or ⅝	⅛	230	120
	¾ or ⅝	¼	10	120

	Iron-pipe size, in.	Port size, in.	Max rated cplg pressure, psi Unheated No. 2 oil or lighter	Heated No. 5 or No. 6 oil	Max fluid temp
	¼ or ⅜	¼	13		120
	¼ or ⅜	⅜	30		120
	¼ or ⅜	½	33		120
	¼ or ⅜	¾	55		120
	¼ or ⅜	1	70		120
	¼ or ⅜	9/64	45		120
	¼ or ⅜	9/64	75		120
	¼ or ⅜	9/64	100		120
	¼ or ⅜	9/64	180		120
	¼ or ⅜	3/16	30		120
	¼ or ⅜	3/16	60		120
	¼ or ⅜	3/16	90		120
Bulletin No. 8268*					
Cat. Nos. 83661	⅜	⅜	180		
83661R	⅜	⅜	180		
83662	⅜	5/32	80		
83662R	⅜	5/32	80		
83663	⅜	¼	30		
83663R	⅜	¼(7/32)	30		
Bulletin No. 8268*	⅜-½	¼	300	300	212
	⅜-½	⅜	600	600	212
	⅜-½	3/16	135	135	212
	⅜-½	3/16	190	190	212
	⅜-½	¼	55	55	212
	⅜-½	¾	95	95	212
	⅜-½	5/16	35	35	212
	⅜-½	5/16	55	55	212
	⅜-½	⅜	50	50	212
	⅜-½	⅜	45	45	212
Cat. No. 236220	⅛	5/32	—	300	200
Cat. No. 23743	⅜	11/16	—	15-300	200
Bulletin No. 8231*	⅜-½	¼	450	400	212
	⅜-½	3/16	135	135	212
	⅜-½	3/16	190	190	212
	⅜-½	¼	55	55	212
	⅜-½	¾	95	95	212
	⅜-½	5/16	35	35	212
	⅜-½	⅜	45	45	212

* This number appears as catalog number on the nameplate together with suffix number(s) and/or letter depending on particular application.

◇◇ With adjustable Main Flow.

Barksdale Valves 5125 Alcoa Av Los Angeles 58 Cal

Model 2061SOHQ2A (1, 2 or 4)V	¼	Full	—	300	250
Model 2062SOHQ2A (1, 2 or 4)V	⅜	"	—	300	250
Model 2063SOHQ2A (1, 2 or 4)V	½	½	—	300	250

Note: These are 3-way valves intended for the combined application of safety shutoff and oil recirculation.

Combustion Control Div Electronics Corp of America One Memorial Dr Cambridge 42 Mass

Models S1FCC4	⅜	⅜	120		
S1FT1	¾	3/16	60		
S1FC2	⅜ or ½	3/16	190	190	190
S1FF1	⅜	5/32		300	300
S1FF3	¼	11/16		15-300	300

General Controls Co 801 Allen Av Glendale Cal

"Hydramotor" Valves

H0V1A — †AO6‡					
300-304	⅛	9/16	300	250	250
305-309	¾	9/16	300	250	250
310-314	1	9/16	300	250	250
315-319	1¼	9/16	300	250	250
H0V12A — †AO6‡					
160-164, 300-304	⅛	13/32	325	250	250

	Iron-pipe size, in.	Port size, in.	Max rated cplg pressure, psi Unheated No. 2 oil or lighter	Heated No. 4 or No. 6 oil
165-169, 305-309	⅜	13/32	275	225
170-174, 310-314	1	13/32	275	225

Note: These are 3-way valves intended for the application of safety shutoff and oil recirculation.

H1V1A — †AO6‡				
100, 107, 101-105, 158	⅛	9/16	400	350
106, 159, 107-111, 160	⅛	9/16	400	350
112, 161, 113-117, 162	⅜	13/16	240	240
118, 163, 119-123, 164	1	1	300	300
124, 165, 125-129, 166	1¼	1¼	180	180
H1V1A — †AO6‡				
274-281	⅛	9/16	400	350
282-289	⅛	9/16	400	350
290-297	⅜	13/16	400	350
298-305	1	1	400	350
306-313	1¼	1¼	300	300
H1V1A — †AO6‡				
167-174	⅛	9/16	275	250
175-183	⅛	9/16	275	250
188-190	⅜	13/16	240	240
191-198	1	1	300	300
199-206	1¼	1¼	180	180
207-214	1½	1½	180	180
215-222	2	2	55	55
222-230	2½	2½	37	37
231-238	3	3	32	32
H1V1A — †AO6‡				
314-321	⅛	9/16	275	250
322-329	⅛	9/16	275	250
330-337	⅜	13/16	275	250
338-345	1	1	275	250
346-353	1¼	1¼	300	300
354-361	1½	1½	300	175
362-369	2	2	115	115
370-377	2½	2½	75	75
378-385	3	3	60	60
H1V1A — †AO6‡				
142, 239, 143, 144, 240	⅛	9/16	400	350
145, 241, 146, 147, 242	⅛	9/16	400	350
148, 243, 149 150, 244	⅜	13/16	300	300
151, 245, 152, 153, 246	1	13/16	300	300
154, 247, 155, 156, 248	1¼	13/16	300	300
249-253	⅛	9/16	275	250
254-258	⅛	9/16	275	250
259-263	⅜	13/16	300	300
264-268	1	13/16	300	300
269-273	1¼	13/16	300	300
388-391	1½	1	180	175
391-395	2	1¼	135	135
H2V1A — †AO6‡				
124, 164, 125-129, 155	1½	1½	180	180
130, 156, 131-135, 157	2	2	55	55
136, 158, 137-141, 159	2½	2½	37	37
433-441	2½	2½	37	37
142, 160, 143-147, 161	3	3	32	32
442-446	3	3	32	32
H2V1A — †AO6‡				
174-181	1½	1½	300	300
182-189	2	2	115	115
190-197	2½	2½	75	75
450-457	2½	2½	75	75
198-205	3	3	60	60
458-465	3	3	60	60
H2V1A — †AO6‡				
214-221	1½	1½	300	300
H2V1A — †AO6‡				
166-168	1½	1	180	180
169-173	2	1¼	135	135
H2V1A — †AO6‡				
223-229				
230-237	1	1	235	150
238-253	1	1	400	300
254-261	1	1	400	300
262-285	1½	1½	235	150
286-293	1½	1½	300	300
294-317	1½	1½	200	180
318-340	1½	1½	200	180
	2	2	115	115

	Iron-pipe size, in.	Port size, in.	Max rated opng pressure, psi Unheated No. 3 oil or lighter	Heated No. 5 or No. 6 oil	Max fluid temp
	2½	2½	75	75	250
	3	3	50	50	250
	1½	1½	250	250	250
	2	2	180	180	250
	2	1½	275	200	250
	2½	2½	95	95	250
	2½	1½	250	250	250
	2½	2½	95	95	250
	2½	1½	180	180	250
	3	3	55	55	250
	3	2	150	55	250
	3	3	65	55	250
	3	2	150	150	250
	2½	1½	250	250	250
	3	2	150	150	250
	1½	1½	250	250	250
	1½	1½	250	250	250
	2	1½	275	275	250
	3	1½	275	275	250
	3	3	150	150	250
	3	2	150	150	250
	2	1¼	275	275	250
	2½	1½	250	250	250
	2½	1½	150	150	250
	3	2	150	150	250
	4	3	65	65	250
	1½	1½	150	250	250
	2	2	150	150	250
	2½	2½	95	95	250
	2½	2½	95	95	250
	3	3	65	65	250
	3	3	65	65	250
	4	4	35	35	250
	6	6	15	15	250

† Insert 3- or 4-figure number shown below which indicates voltage, frequency, etc.

‡ AO5 — with required dust shields; for other accessory groups which include dust shields consult manufacturer.

				*	**
K-10A and K-10B	⅛	0.125	200	200	180–210
(carbide floor)	⅛–¼	0.125	200	200	125–175
(Viton or Soft Seat) ***	⅛–¼	0.177	150	150	125–175
	⅛–¼	0.203	110	110	125–175
	⅛–¼	0.25	75	75	125–175

Note: (1) Opening times for above valves range from 5 to 20 seconds; for opening time of a given Cat. No. valve consult the manufacturer.

(2) When ordering, specify oil pressure and temperature to obtain correct disk.

* Class A Insulated Coil

** Class B Insulated Coil

*** For soft seats, pressures and fluid temperatures (ambient, for unheated fuel-oils) are not to exceed:

300 psig. regardless of temperature

150°F. for pressures up to 150 psig.

100°F. for pressures from 150 psig. to 300 psig

	⅛–¼	0.187	200	200	104–210
	⅛–¾	0.265	150	150	104–210
	⅛	0.313	100	100	104–210
	⅛–¾	0.375	70	70	104–210
K-10A (only)	⅛–¾	0.250	200	200	—–250
	⅛–¾	0.312	200	100	—–250
	⅛–¾	0.437	100	100	—–250

Note: (1) Opening times for above valves range from 5 to 20 seconds; for opening time of a given Cat. No. valve consult the manufacturer.

(2) When ordering, specify oil pressure and temperature to obtain correct disk.

K-21A	⅛	3/32	55	
(Viton or Soft Seat)	¼	5/32	24	
	⅜	7/32	12	

	Iron-pipe size, in.	Port size, in.	Max rated opng pressure, psi Unheated No. 3 oil or lighter	Heated No. 5 or No. 6 oil	Max fluid temp
Type K-21E (Metal or Soft Seat except ⅛ in. port size)	⅛	5/32	180		
	¼	7/32	90		
	⅜	¼	55		
Type K-25A	⅛	1/10	55		
Type K-25E	¼	5/32	180		
	⅜	7/32	90		
Type K-21M	¼	1/16	125	125	180
	⅜	5/32	18	18	180
Type K-21N	⅛	3/32	100	100	135
	¼	5/32	40	40	135
	⅜	7/32	25	25	135
Type K-27A, -C Brass Body A — Std. C — Adj. Flow	⅛ or ¼	3/64	300	300	180
	¼ or ⅜	1/16	250	250	180
	⅛ or ¼	3/32	200	200	180
	⅛ or ¼	⅜	125	125	180
	⅛ or ¼	5/32	55	55	180
	⅜ or ¼	3/16	60	60	180
	¼ or ¼	¼	30	30	180
Type K-27L, -N St. St. Body L — Std. N — Adj. Flow	⅛ or ¼	3/64	300	300	180
	⅛ or ¼	1/16	250	250	180
	¼ or ¼	3/32	200	200	180
	¼ or ¼	⅜	125	125	180
	¼ or ¼	5/32	55	55	180
	⅛ or ¼	3/16	60	60	180
	⅜ or ¼	¼	30	30	180
Type K-271F Aluminum Body F — Std.	¼ or ¼	3/32	200	—	—
Type K-281F	⅛	3/32	125		
	¼	3/32	125		

Hauck Mfg Co 124-136 Tenth St Brooklyn 15 N Y

Solenoid Oil Valves	⅜	⅜	300	300	250
Cat. Nos. 450, 451, 452	½	½	300	300	250
and 453	¾	¾	300	300	250
	1	¾	300	300	250

Jamesbury Corp 45 New St Worcester Mass

Style Nos.					
¼D-22(-32,-36)BB	¼	9/16	150	150	180
¼D-22(-32,-36)TT	¼	9/16	300	300	300
1D-22(-32,-36)BB	1	13/16	150	150	180
1D-22(-32,-36)TT	1	13/16	300	300	300
1¼D-22(-32,-36)BB	1¼	1	150	150	180
1¼D-22(-32,-36)TT	1¼	1	300	300	300
1½D-22(-32,-36)BB	1½	1¼	150	150	180
1½D-22(-32,-36)TT	1½	1¼	300	300	300
2D-22(-32,-36)BB	2	1½	150	150	180
2D-22(-32,-36)TT	2	1½	300	300	300
(3or4)D150F22BB(orTT) *					
(3or4)D150F36BB(orTT)					
(3or4)DF30822BB(orTT)					
(3or4)DF30836BB(orTT)	3-4	2½–3½	150	150	180
BB Valves (Buna N seats)	3-4	2½–3½	300	300	300
TT Valves (Teflon seats)					

* Signal switches are standard to indicate closed valve.

Marsh Instrument Co Div Colorado Oil & Gas Corp Skokie Ill

Model 26750	½	3/32	250	—	—

Maxon Premix Burner Co Muncie Ind

Series 1600 "Gold Band"	1	Full	2		
(Series 600 "Gold Band"	1¼	"	2		
Valve with Minneapolis-Honeywell or Barber-Colman Motor) Trim B*	1½	"	2		
Series 1700 "Red Band"	1M**	Full	50	50	250
(Series 700 "Red Band"	1½M**	"	50	50	250
Valve with Minneapolis-Honeywell or Barber-Colman Motor) Trim B*					

* Class B Trim — Cast iron alloy body and disc, stainless steel seat, bronze stem and bushing for both unheated No. 3 or lighter and heated No. 5 or No. 6 fuel oils.

** Indicates medium pressure model.

NTED CLOSE TO EDGE

	Iron-pipe size, in.	Port size, in.	Max rated opg pressure, psi Unheated No. 3 oil or lighter	Heated No. 5 or No. 6 oil	Max fluid temp
Marcold Corp 4201 Belmont Av Chicago Ill					* **
Type K-10A (Metal or Soft Seat)***	⅛	0.125	300	300	180–210
	⅛–¼	0.125	300	300	135–175
	⅛–⅜	0.177	180	180	135–175
	⅛–½	0.203	110	110	135–175
	⅛–¾	0.25	75	75	135–175
	⅛–¾	0.187	300	300	104–210
	⅛–¾	0.265	180	180	104–210
	⅜	0.312	100	100	104–210
	⅛–¾	0.375	70	70	104–210
	¾	0.218	300	300	—–210
	¾	0.312	180	180	—–210
	¾	0.437	75	75	—–210
Type K-21A (Metal or Soft Seat)	⅛	3/32	55		
	⅛	5/32	24		
	⅛	7/32	13		
Type K-21E (Metal or Soft Seat except ⅛ in. port size)	⅛	5/32	180		
	⅛	7/32	99		
	⅛	¼	55		
Type K-25A	⅛	1/10	55		

* Class A Insulated Coil
** Class B Insulated Coil
*** For soft seats, pressures and fluid temperatures (ambient, for unheated fuel-oils) are not to exceed:
300 psig. regardless of temperature
150°F. for pressures up to 180 psig.
100°F. for pressures from 180 psig. to 300 psig.

Type K-25E	⅛	5/32	180		**
	⅛	7/32	99		
Type K-21M	⅛	1/10	125	125	180
	⅛	5/32	18	18	180
Type K-21N	⅛	3/32	100	100	135
	⅛	5/32	40	40	135
	⅛	7/32	23	23	135
TypeK-27A, -C Brass Body A — Std. C — Adj. Flow	⅛ or ¼	3/64	300	300	180
	⅛ or ¼	1/16	280	280	180
	⅛ or ¼	3/32	300	300	180
	⅛ or ¼	⅛	135	135	180
	⅛ or ¼	5/32	85	85	180
	⅛ or ¼	3/16	60	60	180
	⅛ or ¼	¼	30	30	180
Type K-27L, -N St. St. Body L — Std N — Adj. Flow	⅛ or ¼	3/64	300	300	180
	⅛ or ¼	1/16	280	280	180
	⅛ or ¼	3/32	300	300	180
	⅛ or ¼	⅛	135	135	180
	⅛ or ¼	5/32	85	85	180
	⅛ or ¼	3/16	60	60	180
	⅛ or ¼	¼	30	30	180
Type K-27LF Aluminum Body F — Std.	⅛ or ¼	3/32	300		

** Class B Insulated Coil

Minneapolis-Honeywell Regulator Co Minneapolis 8 Minn				
Type V4001A	⅛	3/64	300	125
"Delayed Oil Valve"	⅛	3/32	125	
Type V4001B	⅛	3/32	180	125
Type V4031A	⅛	0.125	300	
	⅛	0.177	180	
	¼	0.203	110	
		0.250	75	
		0.312	45	
Type V4021B	⅛	0.125	225	180
	⅛	0.177	110	180
	¼	0.203	80	180
		0.250	55	180
		0.312	40	180
Type V4031C	⅛	0.125	225	250
	⅛	0.177	110	250
	¼	0.203	80	250
		0.250	55	250
		0.312	40	250

National-U. S. Radiator Div Cranetown Pa	Iron-pipe size, in.	Port size, in.	Max rated opg pressure, psi Unheated No. 3 oil or lighter	Heated No. 5 or No. 6 oil	Max fluid temp
(O- or G) (E, H or O) (4-10)*	⅛	3/16 max.	75		

* Type No. is actually an oil-burner type valve which has approved safety shutoff valve, characteristics as above.

Pacific Steel Boiler Div Crane Co 231 Central Av				
(4-10)-PBD (O or G) (E or H)*	⅛	3/16 max.	75	75

* Type No. is actually an oil-burner type which has approved safety shutoff valve, characteristics as above.

Petro 3170 West 106th St Cleveland 11 O				
Model W. Approved for Petro. Model W oil burner, only.	⅛	Adj. (3/16 in. max.)	75	75

Webster Electric Co Racine Wis				
MV102	⅛	0.078	150	
MV112	¼	0.078	150	
DV102	⅛	0.078	150	
DV112	¼	0.078	150	

DV valves provide 1 to 4 sec. delay in opening after ...

OIL SAFETY SHUTOFF VALVES, Automatic Opening, Electric & Pressure Operated & Holding

Bailey Meter Co 1050 Ivanhoe Rd Cleveland 10 O	Iron-pipe size, in.	Port size, in.	Max rated opg pressure, psi Unheated No. 3 oil or lighter	Heated No. 5 or No. 6 oil
Styles XSBI-A1 and XFDS-A1*	⅛	Full	300	300
	¼	"	180	180
	⅜	"	300	300
	1	"	300	300
	1¼	"	300	240
	1½	"	300	300
	2	"	300	300
Styles XSDS-A1 and XFDS-A1**	⅛	Full	300	300
	¼	"	300	300
	1	"	300	300
	1¼	"	300	300
	1½	"	300	300
	2	"	300	300
Type XSBI-B	⅛	⅛	300	300
	¼	¼	300	300
Type XSBI-B	⅛	⅛	—	300
	¼	¼	—	300

Note: The XSBI-A are 3-way valves approved for the ... application of safety shutoff and recirculating ... fluid temperature 140°F.).
(Diaphragm press. — shop air at 20–35 psig.)
* Available only in 1, 1¼, 1½, and 2 in. IPS.
** Available only in 1, 1¼, and 1½ in. IPS.

Fisher Governor Co Marshalltown Ia				
Styles FM-XSBI-A1 and FM-XFBS-A1*	⅛	Full	225	250
	¼	"	250	300
	1	"	250	300
	1¼	"	250	300
	1½	"	250	300
	2	"	250	300
Styles FM-XSDS-A1 and FM-XFDS-A1**	⅛	Full	250	300
	¼	"	250	300
	1	"	250	300
	1¼	"	250	300
	1½	"	250	300
	2	"	250	300

(Diaphragm press. — shop air at 20–35 psig.)
* Available only in 1, 1¼, 1½ and 2 in. IPS.
** Available only in 1, 1¼, and 1½ in. IPS.

Orr & Sembower Inc Reading Pa				
Valve No. 880107005 (used with Skinner Electric Valve No. V5-5660C)	⅛	0.03	—	50

Note: Equipment approved for the combined application ... safety shutoff and recirculating oil on Orr & Sembower burners, only. Required operating air pressure 15-6...

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Safety shutoff valves.

NTED CLOSE TO EDGE

GAS SAFETY SHUTOFF VALVES

A safety shutoff gas valve is installed in the gas supply piping to the main and pilot burners of gas-fired equipment to shut off the gas during idle periods or in the event of various unsafe operating conditions. It is usually the "key" unit of all the safety controls used to protect against the fuel-gas explosions or fire hazards such as result from accidental interruption in various services or operations, such as, flame failure, failure of gas supply, failure of exhaust or recirculation, failure of electric power supply, failure of combustion air, excessive temperatures, failure of conveyor drive. Also, it is the "key" unit in gas safety control systems designed to minimize the lighting-off hazards in multi-burner gas-fired equipment.

A safety shutoff gas valve in operation is held open either by electric energy or by pressure (gas or air) or by both. It is self-closing by means of a spring and/or dead weight within five seconds after the holding medium (electric, pressure or both) is cut off. It can be opened, either manually or automatically, only after the holding medium is applied. The valve is suitably enclosed and it cannot be readily by-passed or blocked in the open position. In the case of the manually opened valves, blocking the handle does not prevent closing when the holding medium is cut off.

Strainers are often advisable in the inlet piping, as close as practicable to these valves, to remove foreign particles such as pipe scale.

When ordering, specify the actual condition for each of the items in the table below. Also, as applicable, specify voltage and frequency of power supply, maximum pressures to be encountered, desired opening and tripping pressures, and any unusual temperature, corrosive atmosphere, or dust condition in the vicinity. In event of other gases, the Factory Mutual Engineering Division should be consulted.

Except as noted, valves listed are suitable for manufactured, natural, or LP-gas.

GAS SAFETY SHUTOFF VALVES, Manual Opening, Electric Holding

Automatic Switch Co Florham Park N J

Bulletin 8322 . ° °°	*Iron-pipe size, in.*	*Port size, in.*	*Max rated opg press., psi*
802214 or 802214	1¼	1.6	100
802215 or 802215	1½	1.6	100
802216 or 802216	2	2.6	50
802217 or 802217	2½	2.6	50
802218 or 802218	3	3.1	25
802219 or 802219	4	3.1	[illegible]

802214-802219 series solenoid coils have pressed steel covers. 802214-802219 series have explosionproof covers.

° Number appears on main valve nameplate; also as part of catalog number on solenoid-coil nameplate which may have prefix or suffix letters, denoting particular feature. Example: WP-80224 (weatherproof).

°° Alarm signal switch available as optional equipment; catalog number suffix letter "-SW".

Combustion Control Div Electronics Corp of America Memorial Dr Cambridge 42 Mass

Model		
81RC3°	⅜	11/16
81RC4	1	11/16
81RB5	1¼	21/32
81RS6	1½	1⅛
81RS8	2	1-7/16
81RW10	2½	1-11/16x1-7/16
81RV12	3	2⅛x1-7/16
81GY14°°	4	3-9/16
81GS24°°	6	4½

Model number may have a suffix letter to denote the inclusion of an auxiliary snap-switch. -S denotes SPDT. -D denotes DPDT.

° Cast iron-alloy body, stainless-steel seat, Monel-metal disc, chrome-steel stem.

°° Cast iron-alloy body and seat. Bronze stem and bushing has stainless-steel stem, except 6 in. size.

Eclipse Fuel Engineering Co Rockford Ill

Eclipse Series "LT" Safety Shutoff Valve

4LT-AE	1	Full
5LT-AE	1¼	"
6LT-AE	1½	"
8LT-AE	2	"
10LT-AE	2½	"
12LT-AE	3	"
16LT-AE	4	"
24LT-AE	6	"

General Controls Co 801 Allen Av Glendale Cal

Type			
V-110C32DL2	½	1	400
V-110C32EL2	⅝	1	400
V-110C32FL2	1	1	400
V-110C32GL2	1¼	1¼	275
V-110C32HL2	1½	1½	200
V-110B32HL2	1½	1½	200
V-110C32JL2	2	2	110
V-110A32JL2	2	2	110
V-110C32KL2	2½	2½	75
V-110A32KL2	2½	2½	75
V-110C32LL2	3	3	50
V-110A32LL2	3	3	50
V-110A32NL2	4	4	30
V-110A32QL2	6	6	15
V-110F42FL2	1	1	400
V-110K42FL2	1	1	400
V-110F42GL2	1¼	1¼	275
V-110H42GL2	1¼	1¼	275
V-110F42HL2	1½	1½	200
V-110H42HL2	1½	1½	200
V-110F42JL2	2	2	110
V-110G42JL2	2	2	110
V-110G42KL2	2½	2½	75
V-110G42LL2	3	3	50
V-110E62FA2	1	1¼	35
V-110E62GA2	1¼	1½	35
V-110E62HA2	1½	2	35
V-110E62JA2	2	2½	15

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
7-[illegible]LA3	3½	3	15
7-[illegible]LA3	5	3½	15
7-[illegible]LA3	4	5	10
7-[illegible]QA3	5	6	5
7-[illegible]QA3	6	6	5

Catalog numbers are for 115 v 60 c valves with handwheel type reset, standard disc and no accessories.
For other voltages, alternate reset actions and accessories, consult the factory.

7-110*	1	1½	60
New V136AF115	1¼	1½	80
V136AG115	1½	1½	80
V136AE115	2	2	25
V136AJ115	2½	2	15
V136AK115	3	3	15
V136AL115	3	4	5
V136AN115	4	4½	5
V136AQ115	6		

Valve assemblies available with or without one or two auxiliary SPDT switches for alarm or lamp.

5-107	⅜	5/32	15
	½	5/32	15

...n Pronix Burner Co Muncie Ind

...700 and Series 700-DP	1	Full	125
...n C" Grinnelson	1¼	"	100
...st cast, stem and bush-	1¼M	"	70
...n iron alloy disc and	1½L	"	3
...n body; forged steel	2H	"	70
...ion.)	2M	"	50
	2L	"	3
	2½H	"	30
	2½M	"	10
	2½L	"	2
	3H	"	30
	3M	"	10
	3L	"	3
	4	3-3/16	20
	6	4½	10
...600 and Series 600-DP	1	Full	125
...Solid Seat"*	1¼	"	100
...st iron alloy body and	1½	"	70
...n; stainless steel seat;	2	"	30
...steel stem and bushing	2½	"	30
...ept 6 in. size has stain-	3	"	20
...s steel stem).	4	3-3/16	20
	6	4½	10
...600*	¾&1	11/16 dia	125
	1¼	21/32 dia	100
	1½	1¼ dia	70
	2	1-7/16 dia	40
	2½	1-11/16x1-7/16	30
	3	2¾x1-7/16	20

* Handwheel and chain (for locations in overhead lines) and/or Type MS ...witch Assembly (to operate horn or flasher when valve closes) available ...tional extra.

...th American Mfg Co 4455 E 71st St Cleveland 5 O

...* 22, 22C, 22K1, 22W, 22D, ...2C, 22K1, 22DW	¾	Full	150
0-M-S	1	"	150
1-M-S	1¼	"	150
1½-M-S	1½	"	125
2-M-S	2	"	100
2½-M-S	2½	"	80
3-M-S	3	"	40
4-M-S	4	"	30
5-M-S	6	"	12
6-M-S			

* Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes), and/or companion flanges (to provide threaded connections for flanged 2½ to 6 in. valves) available as optional extras.
† 24-in. IPS max.

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
Pyronics Inc 17700 Miles Av Cleveland 28 O			
4MRV	¾	Full	150
8MRV	1	"	150
10MRV	1¼	"	150
12MRV	1½	"	135
16MRV	2	"	100
20MRV	2½	"	80
24MRV	3	"	40
32MRV	4	"	30
48MRV	6	"	12

Ruggles-Klingemann Mfg Co Salem Mass

Fig. 485	¼	Full	600
	⅜	"	600
	½	"	600
	¾	"	600
	1	"	600
	1¼	"	600
	1½	"	600
	2	"	600
	2½	"	300
	3	"	300
	4	"	150
	5	"	125
	6	"	125
Fig. 499	¼	Full	150
	⅜	"	150
	½	"	150
	¾	"	150
	1	"	150
	1¼	"	150
	1½	"	100
	2	"	80
	2½	"	40
	3	"	30
	4	"	30
	5	"	15
	6	"	15

Western Products Inc New Castle, Ind

Models EG-1 (gas switch), FG-1S (SPDT switch), FG-1D (DPDT switch).

Trim L or MO	¾	Full	125
	1	"	100
	1¼	"	100
	1½	"	80
	2	"	35
	2½	"	30
	3	"	25
Trim O	4	Full	15
	6	"	

Note: Trim L — Ductile iron disc; iron seat; brass stem and bushing
Trim MO — Ductile iron disc, stem and bushing; iron seat
Trim O — Ductile iron disc, stainless steel stem, cast iron seat.

GAS SAFETY SHUTOFF VALVES, Manual Opening, Pressure Holding

Eclipse Fuel Engineering Co Rockford Ill

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
Eclipse Series "LT" "Safety Shutoff Valve"		Full	30
4LT-*	1	"	30
5LT-*	1¼	"	30
6LT-*	1½	"	30
8LT-*	2	"	30
10LT-*	2½	"	30
12LT-*	3	"	30
16LT-*	4	"	10
24LT-*	6	"	

* Add designation of one of the following gas or air pressure Power (Holding) Units:

Designation of Power Unit	Max. Rated Press. (P.S.I.G.)	Approx. Trip Press.
LLGLLA	2	0.5- 1.3 in. W.C.
LGLA	2	1 - 2 in. W.C.
MGMA	12	13 -10 in. W.C.
HGHA	30	2 - 3.5 psig.

North American Mfg Co 4455 E 71st St Cleveland 5 O

Series** 22, 22C, 22K1, 22W	¾	Full	150
0-M-(G or H)*	1	"	150
1-M-(G or H)*	1¼	"	150
1½-M-(G or H)*	1½	"	125
2-M-(G or H)*	2	"	
2½-M-(G or H)*			

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
6-M-(G or H)*	2	Full	180
5-M-(G or H)*	2½	"	80
6-M-(G or H)*	3	"	40
7-M-(G or H)*	4	"	30
8-M-(G or H)*	6	"	12

* G denotes diaphragm for air or gas (max. rated press. 5 psi, approx. trip press. 1 in. WC). H denotes diaphragm for air, gas, or oil (max. rated press. 180 psi, approx. trip press. 8 psi).

** Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes), and/or companion flanges (to provide threaded connection for flanged 2½ to 6 in. valves) available as optional extras.

† 2-in. IPS max.

GAS SAFETY SHUTOFF VALVES, Manual Opening, Combination Electric & Pressure Holding

Eclipse Fuel Engineering Co Rockford Ill

Eclipse Series "LT" "Safety Shutoff Valve"	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
4LT-AE*	1	Full	30
5LT-AE*	1¼	"	30
6LT-AE*	1½	"	30
8LT-AE*	2	"	30
10LT-AE*	2½	"	30
12LT-AE*	3	"	30
16LT-AE*	4	"	30
24LT-AE*	6	"	10

* Add designation of one of following gas or air pressure Power (Holding) Units.

Designation of Power Unit	Max. Rated Press. (P.S.I.G.)	Approx. Trip Press.
LLGLLA	2	0.5- 1.3 in. W.C.
LGLM	2	1 - 2 in. W.C.
MGMA	12	12 -10 in. W.C.
HGHA	30	2 - 3.5 psig.

GAS SAFETY SHUTOFF VALVES, Manual Opening, Duplex Pressure Holding

Eclipse Fuel Engineering Co Rockford Ill

Eclipse Series "LT" "Safety Shutoff Valve"	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
4LT-A-*	1	Full	30
5LT-A-*	1¼	"	30
6LT-A-*	1½	"	30
8LT-A-*	2	"	30
10LT-A-*	2½	"	30
12LT-A-*	3	"	30
16LT-A-*	4	"	30
24LT-A-*	6	"	10

* Add designation of one of following gas or air pressure Power (Holding) Units where each asterisk appears.

Designation of Power Unit	Max. Rated Press. (P.S.I.G)	Approx. Trip Press.
LLGLLA	2	0.5- 1.3 in. W.C.
LGLA	2	1 - 2 in. W.C.
MGMA	12	12 -10 in. W.C.
HGHA	30	2 - 3.5 psig.

North American Mfg Co 4455 E 71st St Cleveland 5 O

Series** 22, 22C, 22K†, 22W	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
0-M-(D or J)*	¼	Full	180
1-M-(D or J)*	½	"	180
2-M-(D or J)*	1¼	"	180
3-M-(D or J)*	1½	"	135
4-M-(D or J)*	2	"	100
5-M-(D or J)*	2½	"	80

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
6-M-(D or J)*	3	Full	
7-M-(D or J)*	4	"	
8-M-(D or J)*	6	"	

* D denotes one diaphragm for air or gas (max. rated press. 5 psi, trip press. 3 in. WC), and the other for air, gas, or oil (max. rated press. approx. trip press. 4 psi). J denotes both diaphragms for air or gas (max. press. 5 psi, approx. trip press. 3 in. WC).

** Handwheel and chain (for overhead locations), signal-switch assembly (to operate horn or flasher when valve closes), and/or companion flanges (to provide threaded connection for flanged 2½ to 6 in. valves) available as optional extras.

GAS SAFETY SHUTOFF VALVES, Automatic Opening, Electric Opening & Holding

American Standard Controls Div 3900 Trumbull Av Detroit Mich

	Iron-pipe size, in.	Port size, in.	Max rated opng press., psi
Type 7, No. 643-7 **	¾	½	35
	¾	3/16	35
	¾	7/32	35

** Recommended only for use on pilot burners or on small main burners, either case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 Btu per hour.

Automatic Switch Co Florham Park N J

Bulletin Nos. 8080A** and 8081A**			
Cat. Nos. 8080 (or 1)A1	¾	½	1
8080 (or 1)A41	¾	½	1
8080 (or 1)A2	¾	Full	1
8080 (or 1)A42	¾	Full	1
8080 (or 1)A3	¾	11/16	1
8080 (or 1)A43	¾	11/16	1
Note: "8081" series has explosionproof enclosure.			
Cat. Nos. 8210A1G** and 8211A1G**	¾	½	1
8210A3G** and 8211A3G**	½	½	1
Bulletin No. 8261**			
Cat. Nos. 82612	¼	3/32	1
T82612	¼	3/32	1
LM82112	¼	3/32	1
82613	¼	7/64	1
T82613	¼	7/64	1
LM82613	¼	7/64	1
Bulletin Nos.	¼ or ⅜	¼	6
8263**	¼ or ⅜	¼	1
T8263**	¼ or ⅜	¼	1
LM8263**	¼ or ⅜	¼	2
	¼ or ⅜	¼	2
	¼ or ⅜	⅜	1
	¼ or ⅜	⅜	1
	¼ or ⅜	⅜	1
	¼ or ⅜	⅜	1
	¼ or ⅜	⅜	1
	¼ or ⅜	⅜	4
	¼ or ⅜	⅜	6
	¼ or ⅜	9/64	1
	¼ or ⅜	9/64	1
	¼ or ⅜	9/64	1
	¼ or ⅜	9/64	1
	¼ or ⅜	9/64	2
	¼ or ⅜	3/16	2
	¼ or ⅜	3/16	4
	¼ or ⅜	3/16	6
	¼ or ⅜	3/16	1
	¼ or ⅜	3/16	6
Bulletin No. 8262** In the following Cat. Nos. only			
Cat. Nos.			
82621 and 82621M*	½	1/16	3
82622 and 82622M*	½	½	1
82623 and 82623M*	½	5/32	6
82624 and 82624M*	½	3/16	6

	Iron-pipe size, in.	Port size, in.	Max rated opg press., psi
	⅛	1/16	300
	⅛	⅛	150
	¼	5/32	90
	½	3/16	80
	⅛	⅛	300
	⅛	⅛	300
	¼	5/32	150
	¼	5/32	150
	¼	⅛	85
	¼	⅛ (7/32)	55
	¼ or ⅜	⅛	370
	¼ or ⅜	⅛	370
	⅛ or ½	3/16	140
	⅛ or ½	3/16	200
	⅛ or ½	¼	80
	⅛ or ½	¼	150
	⅛ or ½	¼	80
	⅛ or ½	3/16	55
	⅛ or ½	3/16	30
	⅛ or ½	⅛	35
	⅛ or ½	⅛	475
	⅛ or ½	3/16	140
	⅛ or ½	3/16	200
	⅛ or ½	⅛	80
	⅛ or ½	⅛	120
	⅛ or ½	⅛	55
	⅛ or ½	5/16	55
	⅛ or ½	⅛	35

The number etc. can go catalog number on the nameplate together with number (s) and/or s. "or depending on particular application.
With adjustable Main flow.
Recommended only for use on pilot burners or on small main burners; in other case, of a capacity such ..'vat each valve will control a gas flow equivalent to less than 150,000 Btu per hour.

Conso-Coleman Co Wheelco Instruments Div Rockford Ill

	1	Full	70
Co-Coleman	1½	"	70
½" flares	1½	"	70
½" cast iron alloy body	2	"	70
½" alloy disc; stainless	2½	"	30
½" steel seat; bronze	3	"	30
½" stem and bushing,	4	2-3/16	30
½" cast ½ in. size less	6	4½	10
½" stainless steel stem.)		Full	70
½" flares	1	"	70
½" stainless steel seat,	1½	"	70
½" stem, and bushing;	1½	"	70
½" cast alloy disc and	2	"	30
½" valve body; forged	2½	"	30
½" steel carrier.)	3	"	30
	4	2-3/16	10
	6	4½	10

Controls Division Penn Controls Inc 4000 W Burnham St Box 461
Milwaukee 1 Wis

Solenoid" Series GF5A2	⅜	0.6	⅛
1.1752**	⅛	0.375	5
1.432	⅛	0.375	5
1.433	⅛	0.375	5
1.2023	⅛	0.375	5
1.2022			

(1, .432: 115v 60c coil
2, .432: 208 or 220v 60c coil)
Recommended only for use on pilot burners or on small main burners; in other case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 Btu per hour.

Combustion Control Div Electronics Corp of America One General Dr Cambridge 42 Mass

1.1 SIFT1**	⅛	3/16	60
SIFC02**	⅛	⅛	120
SIFC2**	⅛ or ⅛	3/16	200
SIFS2**	⅛	Full	15
SILS2*	1	"	70
SILS2*	1½	"	70
SILS2*	1½	"	70
SILS2*	2	"	70
SILV12*	2½	"	30
SILV12*	3	"	30

	Iron-pipe size, in.	Port size, in.	Max rated opg press., psi
SILLT10*	4	3-3/16	30
SILS04*	6	4½	10

* Cast iron-alloy body and disc; stainless-steel seat; bronze stem and bushing, except 6 in. which has stainless-steel stem.
** Recommended only for use on pilot burners or on small main burners; in other case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 Btu per hour.

Eclipse Fuel Engineering Co Rockford Ill

104MV-3, or -4	1	Full	80
105MV-3, or -4	1½	"	80
106MV-3, or -4	1½	"	70
108MV-3, or -4	2	"	30
110MV-3, or -4	2½	3	30
112MV-3, or -4	3	Full	30
113MV-3, or -4	4	"	20
116MV-3, or -4	6	3	10
124MV-3, or -4	2½	2	30
110HMV-3, or -4	3½	3	30
112HMV-3, or -4	3	Full	30
116HMV-3, or -4	4	"	20

Note: These valves start to open when energized and are fully open in approx. 20 sec.

1-DOL-3, -3 or -4 **	⅜	⅜	15.0
2-DOL-3, -3, or -4 **	½	½	15.0
5-DOL-3, -3, or -4 **	⅝	⅝	15.0

** Recommended only for use in pilot burners or on small main burners; in other case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 Btu per hour.

General Controls Co 801 Allen Av Glendale Cal
"Hydrameter" Valves

H0V1A—†AO61			
300-304	⅛	9/16	300
305-309	⅛	9/16	300
310-314	1	9/16	300
315-319	1½	9/16	300
H0V1A—1*			
320-324	2	2½	5
325-329	2½	3	5
240-244	3	3½	5
H0V1A—1*			
245-249	⅜	1	5
250-254	1	1	5
255-259	1½	1½	5
260-264	1½	1½	5
265-269	2	2½	5
270-274	2½	3	5
275-279	3	3½	5
H1V1A—†AO61			
100, 107, 101-106, 108	⅛	9/16	600
109, 180, 107-111, 169	⅛	9/16	600
112, 161, 113-117, 162	⅜	13/16	340
118, 163, 119-132, 164	1	1	200
124, 165, 125-129, 166	1½	1½	150
H1V1A—†AO61			
274-281	⅛	9/16	600
282-289	⅛	9/16	600
290-297	⅜	13/16	600
298-305	1	1	600
306-313	1½	1½	600
H1V1A—†AO61			
167-174	⅛	9/16	375
175-182	⅛	9/16	375
183-190	⅜	13/16	340
191-198	1	1	200
199-206	1¼	1¼	150
207-214	1½	1½	100
215-222	2	2	55
223-230	2½	2½	37
231-238	3	3	25
H1V1A—†AO61			
314-321	⅛	9/16	375
322-329	⅛	9/16	375
330-337	⅜	13/16	375
338-345	1	1	375
345-353	1¼	1¼	200
354-361	1½	1½	200
362-369	2	2	110
370-377	2½	2½	75
378-385	3	3	60

	Iron-pipe size, in.	Port size, in.	Max rated sptg press., psi
H117A—†*			
F113, F114	1	1¼	80
G113, G114	1¼	1¼	50
H113, H114	1½	1½	50
J113, J114	2	2	50
K113, K114	2½	2	30
L113, L114	3	3	8
N113, N114	4	4	8
Q113, Q114	6	6	8
H117A—†*			
F213, F214	1	1¼	80
G213, G214	1¼	1¼	60
H213, H214	1½	1½	50
J213, J214	2	2	30
K213, K214	2½	2	8
L213, L214	3	3	8
N213, N214	4	4	6
Q213, Q214	6	6	3
H118A—†*			
F123, F124	1	1¼	55
G123, G124	1¼	1¼	35
H123, H124	1½	2	25
J123, J124	2	2½	15
K123, K124	2½	3	15
L123, L124	3	4	15
N123, N124	4	4	15
P123, P124	5	5	10
Q123, Q124	6	6	5
H118A—†*			
F223, F224	1	1¼	55
G223, G224	1¼	1½	35
H223, H224	1½	2	25
J223, J224	2	2½	15
K223, K224	2½	3	15
L223, L224	3	4	15
N223, N224	4	4	15
P223, P224	5	5	10
Q223, Q224	6	6	5
H118S—†°			
1004	2	2½	15
1005	3	4	15
1006	2½	3	15

† Insert letter and/or 3- or 4- figure number shown below which indicates voltage, frequency, etc.

‡ AOS — with required dust shields; for other accessory groups which include dust shields consult manufacturer.

° Accessory groups for valves on which dust shields or the equivalent are standard. F1, F2 groups on H117A. F1, F2, D2 groups on H118A. For other accessory groups, consult manufacturer.

Note: Opening times for above valves range from 5 to 90 seconds; for opening times of a given Cat. No. valve, consult manufacturer.

H1V1A—†AOS‡			
142, 230, 143, 144, 240	⅜	9/16	400
145, 241, 146, 147, 242	½	9/16	400
148, 243, 149, 150, 244	¾	13/16	300
151, 246, 152, 153, 246	1	13/16	270
154, 247, 155, 156, 248	1¼	13/16	260
H1V1A—†AOS‡			
249-259	¾	9/16	375
254-258	½	9/16	275
259-263	¾	13/16	300
264-268	1	13/16	200
269-273	1¼	13/16	200
268-290	1½	1	180
291-295	2	1¼	135
H2V1A—†AOS‡			
124, 154, 126-128, 155	1¼	1¼	220
130, 156, 131-133, 157	2	2	55
134, 158, 137-141, 159	2½	2½	37
654-661	2½	2½	37
142, 160, 143-147, 161	3	3	35
662-669	3	3	35
H2V1A—†AOS‡			
174-181	1½	1½	200
183-189	2	2	115
190-197	2½	2½	75
650-657	2½	2½	75
198-205	3	3	50
658-665	3	3	50

	Iron-pipe size, in.	Port size, in.	Max rated sptg press., psi
H2V1A—†AOS‡			
214-221	1½	1½	200
H2V1A—†AOS‡			
164-166	1½	1	115
169-173	2	1½	75
H2V1A—†AOS‡			
222-229	1	1	200
230-237	1	1	115
238-253	1	1	75
254-261	1½	1½	200
262-269	1½	1½	115
266-282	1½	1½	75
284-317	1½	1½	50
318-349	2	2	50
350-373	2½	2½	50
374-397	3	3	50
H2V1A—†AOS‡			
422-429	2	2½	75
426-429	2½	2	50
430-433	2	2½	75
H2V1A—†AOS‡			
666-669	1	1½	200
670-673	1½	1½	115
674-677	1½	1	75
H2V1A—†AOS‡			
678-681	1	1½	200
682-685	1½	1½	115
686-689	1½	2	75
690-693	2	2½	75
694-697	2½	2	50
698-701	2	2½	75
H2V1A—†AOS‡			
936, 938, 939	1	1¼	200
940, 942, 943	1¼	1½	115
944, 946, 947	1½	2	75
948, 950, 951	2	2½	75
952, 954, 955	2½	2	50
956, 958, 959	2	2½	75
H2V1A—†AOS‡			
910, 920, 908, 910	4	4	15
921, 922, 913, 914	5	5	10
923, 924, 917, 918	6	6	5
H2V1A—†AOS‡			
300-308	1½	1½	200
301-303	2	2	115
305-306	2	1½	75
301-303	2½	2½	75
306-308	2½	1½	50
631-633	2½	2½	50
635-637	2½	1½	50
311-313	3	3	50
316-318	3	3	100
634-636	3	3	50
638-640	3	3	50
321-323	4	4	30

† Insert 3-figure number shown below which indicates voltage, frequency, etc.

‡ AOS — with required dust shields; for other accessory groups which include dust shields consult manufacturer.

Note: Opening times for above valves range from 5 to 90 seconds; for opening times of a given Cat. No. valve, consult manufacturer.

326-332	4	3	65
331-333	5	5	35
336-338	6	6	15
H2V1A—†AOS‡			
341-343	2½	1½	200
346-348	3	3	100
H2V1A—†AOS‡			
910-921	1½	1½	200
923-934	1½	1½	200
935-937	2	1½	375
938-950	2	1½	375
951-953	3	3	100
954-966	3	3	100

	Iron-pipe size, in.	Port size, in.	Max rated opg press., psi
—10SS	2	1½	275
10S	2½	1½	250
10S	2½	1½	250
10S	3	3	150
10S	3	3	150
10S	4	3	65
—10SS	1½	1½	250
10S	2	2	150
10S	2½	2½	95
10S	2½	2½	95
10S	3	3	65
10S	3	3	35
10S	4	4	15
10S	6	6	
10S			15
—10SS	4	4	10
10S	5	5	5
10S	6	6	5

...t 1-figure number shown below which indicates voltage, frequency, etc. ...-with-applied dust shields; for other accessory groups which include ...ith consult manufacturer.

...Op ring times for ¾thru valves range from 5 to 30 seconds; for opening ...of a given Cat. No. valve, consult manufacturer.

E-8A**	¼	¼	0.5
	⅜	⅜	0.5
	½	Full	2
	¾	"	1
	½	"	0.07
	¾	"	10
	¾	"	5
	½	"	3
	¾		
	¾	Full	10
E-8B**	¾	¾	10
	¾	Full	5
	¾		
E-8BS**	¾	0.50	2
	¾	0.50	2
...E-10A and E-10B**	¾	0.125	230
...(Automatic flow)	¾-½	0.135	235*
...(Metal or Soft Seat)	¾-½	0.177	165
	¾-½	0.203	130
	¾	0.25	80
	¾-½	0.26	235*
	¾-¾	0.187	165
	¾-¾	0.266	110
	½	0.313	75
	¾-¾	0.375	
E-10A (only) **	¾-¾	0.250	200
	¾-¾	0.312	200
	¾-¾	0.437	100
E-15A**	¾	3/32	200
...(Metal or Soft Seat)	¾	5/32	70
	¾	7/32	35
E-15S**	¾	5/32	275
...(Metal or Soft Seat except	¾	7/32	160
...(w. port size)	¾	¼	100
E-15A**	¾	1/10	160
E-15B**	¾	5/32	275
	¾	7/32	160
E-15S**	¾	1/16	125
	¾	5/32	15
E-15S**	¾	3/32	100
	¾	5/32	40
	¾	7/32	25
E-8A, -C**	¼ or ⅜	3/64	300
...Body	½ or ¾	1/16	230
—Std.	½ or ¾	3/32	200
—Adj. Flow	½ or ¾	⅛	135
	½ or ¾	5/32	85
	½ or ¾	3/16	60
	½ or ¾	¼	30

	Iron-pipe size, in.	Port size, in.	Max rated opg press., psi
Type K-27L, -N**	¼ or ⅜	3/64	300
St. St. Body	¼ or ⅜	1/16	230
L — Std.	½ or ¾	3/32	200
N — Adj. Flow	½ or ¾	⅛	135
	½ or ¾	5/32	85
	½ or ¾	3/16	60
	½ or ¾	¼	30

* With resilient seat — 3/32" orifice.

** Recommended only for use on pilot burners or on small main burners; in either case, of a capacity such that each valve will control a gas flow equivalent to less than 180,000 BTU per hour.

Jamesbury Corp 45 New St Worcester Mass

Style Nos.	¼D-22(-33,-66)BB	¼	9/16	150
	¼D-22(-33,-66)TT	¼	9/16	300
	1D-22(-33,-66)BB	1	13/16	150
	1D-22(-33,-66)TT	1	13/16	300
	1¼D-22(-33,-66)BB	1¼	1	150
	1¼D-22(-33,-66)TT	1¼	1	300
	1½D-22(-33,-66)BB	1½	1¼	150
	1½D-22(-33,-66)TT	1½	1¼	300
	2D-22(-33,-66)BB	2	1¾	150
	2D-22(-33,-66)TT	2	1¾	300
	(Ser4)D150F22BB (or TT)			
	(Ser4)D150F22BB (or TT)			
	(Ser4)DF300S22BB (or TT)			
	(Ser4)DF300S22BB (or TT)			
BB Valves (Buna N seats)		¾	1 ⅜ x 3⅛	150
TT Valves (Teflon seats)		¾	2¾ x 3⅛	300

TT valves are recommended for LP-gas service.

Signal switches are standard to indicate closed valve.

Magnatrol Valve Corp 67 Fifth Av Hawthorne N J

15D11 **	⅜	⅜	15
15D12 **	⅜	⅜	10
15D18 **	¼	¼	4
30D11 **	⅜	⅜	30
30D12 **	⅜	⅜	30
30D18 **	¼	¼	7.5

** Recommended only for use on pilot burners or on small main burners; in either case, of a capacity such that each valve will control a gas flow equivalent to less than 180,000 BTU per hour.

Maxon Premix Burner Co Muncie Ind

Series 1600 "Gold Band"	1	Full	2
(Available with either	1¼	"	2
Minneapolis-Honeywell or	1½	"	2
Barber-Colman Motor	2	"	2
Operators.)	2½	"	2
(Cast iron alloy body and	3		
disc; stainless steel seat;			
bronze stem and bushing.)			
Series 4600	1	Full	70
(Cast iron alloy body and	1¼	"	70
disc; stainless steel seat;	1½	"	70
bronze stem and bushing,	2	"	50
except 6 in. size has stain-	2½	"	30
less steel stem.)	3	"	20
	4	3-5/16	10
	6	4½	10
Series 4700	1	Full	70
(Stainless steel seat, stem,	1¼	"	70
and bushing; iron alloy	1½	"	70
disc and valve body;	2	"	50
forged steel carrier.)	2½	"	30
	3		20
	4	3-5/16	10
	6	4½	

Mercoid Corp 4201 Belmont Av Chicago Ill

Type K-8A**	¼	¼	0.5
	⅜	⅜	0.5
	½	Full	2
	¾	"	1
	½	"	0.07
	¾	"	

	Iron-pipe size, in.	Port size, in.	Max rated cpcty rec., psi
	¾	Full	10
	1	"	6
	1¼	"	3
Type K-3E**	1	Full	10
	¾	¾	10
	1¼	Full	5
Type K-10A** (Metal or Soft Seat)	¾	0.136	220
	¾-1	0.136	325*
	¾-1	0.177	165
	¾-1	0.302	120
	¾-1¼	0.25	80
	1-1¼	0.187	325*
	1-1¼	0.302	165
	¾	0.312	110
	¾-1¼	0.375	75
	1¼	0.218	325*
	1	0.313	165
	1¼	0.437	80
Type K-21A** (Metal or Soft Seat)	¾	3/32	300
	1	5/32	70
	1½	7/32	35
Type K-21E** (Metal or Soft Seat except ¾ in. port size)	¾	5/32	275
	1	7/32	160
	1½	¼	100

* With resilient seat — 300 psig.

** Recommended only for use on pilot burners or on small main burners; in either case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 BTU per hour.

Type K-25A**	¾	1/16	160
Type K-25E**	¾	5/32	275
	1	7/32	160
Type K-31M**	¾	1/16	125
	1	5/32	15
Type K-31N**	¾	3/32	100
	1	5/32	40
	1½	7/32	25
Type K-27A, -C Brass Body A — Std. C — Adj. Flow	¼ or ⅜	3/64	300
	½ or ¾	1/16	280
	½ or ¾	3/32	200
	½ or ¾	¼	135
	½ or ¾	5/32	85
	½ or ¾	3/16	60
	½ or ¾	¼	30
Type K-27L, -N St. St. Body L — Std. N — Adj. Flow	¼ or ⅜	3/64	300
	½ or ¾	1/16	280
	½ or ¾	3/32	200
	½ or ¾	¼	135
	½ or ¾	5/32	85
	½ or ¾	3/16	60
	½ or ¾	¼	30

** Recommended only for use on pilot burners or on small main burners; in either case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 BTU per hour.

Minneapolis-Honeywell Regulator Co Minneapolis 8 Minn

Types V40A ** and V80A **	½	0.84	0.5
	½ sm.	0.84	0.5
	½ lg.	0.85	0.5
	¾ sm.	0.85	0.5
	¾ lg.	0.84	0.5
Types VA435A ** and VA885A **	¾	0.860	0.5
	1	0.860	0.5
	1½ lg.	0.860	0.5
	1¼	0.860	0.5
Types V405A ** and V885A **	¼	Full	0.25
	⅜	9/32	0.25
	½	Full	0.50
	¾	9/32	0.50

	Iron-pipe size, in.	Port size in.	Max rated cpcty rec., psi
Type V405A **	¼	Full	1
	⅜	9/32	1
Type V4031B**	¾	3/32	125
Type V4031A **	¾	0.125	30
	1	0.177	15
	1¼	0.302	15
		0.250	15
		0.312	7
Type V4031B, C **	¾	0.125	4
	1	0.177	15
	1¼	0.302	15
		0.250	8
		0.312	8
Type V4034A	1	1.00	6
	1¼	1.00	4
	1½	1.00	3
	2	2.74	3
	2½	3.13	3
	3	3.13	3

** Recommended only for use on pilot burners or on small main burners; in either case, of a capacity such that each valve will control a gas flow equivalent to less than 150,000 BTU per hour.

GAS SAFETY SHUTOFF VALVES, Automatic Opening, Electric & Pressure Operated & Holding

Bailey Meter Co 1050 Ivanhoe Rd Cleveland 10 O

	Iron-pipe size, in.	Port size, in.	Max rated cpcty psig
Styles XFAI-A1, XFAS-A1 (125 psi. steel body) and XFBS-A1 (300 psi. steel body) (Diaphragm press. shup air at 20-35 psig.)	1	Full	125
	1¼	"	125
	1½	"	125
	2	"	125
	2½	"	125
	3	"	125
	4	"	125
	5	"	125
	6	"	125
	8	"	125

Clayton Manufacturing Co Box 550 El Monte Cal

Model UH-3048	1½	Full	15 in. w.c.
Model UH-3047	2	"	15 in. w.c.
Model UH-3048	3	"	15 in. w.c.

(Diaphragm air pressure 3.5-4.5 in. w.c. Equipment intended for use on Clayton steam generators, only. Not suitable for use with LP-Gas.)

Fisher Governor Co Marshalltown Ia

Styles FM-XFAI-A1, FM-XFAS-A1 (125 psi. steel body) and FM-XFBS-A1 (300 psi. steel body) (Diaphragm press. shup air at 20-35 psig.)	1	Full	125
	1¼	"	125
	1½	"	125
	2	"	125
	2½	"	125
	3	"	125
	4	"	125
	5	"	125
	6	"	125
	8	"	125

Mason-Neilan Div of Worthington Corp 63 Nahatan St Norwood Mass

Nos. 531-2 and -3 (No. 531-3 has push button device which can be used to manually cause valve opening and closure.)	¾	Full	150
	1	"	150
	1¼	"	150
	1½	"	150
	2	"	150
	2½	"	150
	3	"	150
	4	"	150
	6	"	150

COPY PRINTED

INDUSTRIAL TRUCKS

USTRIAL TRUCKS, Type G or D, Gasoline- or Diesel-powered

ctory Mutual approval of gasoline- or diesel-powered trial trucks indicates that the trucks are designed hat with adequate maintenance, the fire hazard ated with equipment of this type is minimized. rthless, it is essential that the truck be operated rly and that the location and occupancy involved onsidered safe for the use of such equipment.

general summary, this equipment may be used y inside buildings with combustible occupancies as cloth or grocery storage, paper manufacturing, er tanning and some textile processing (except, for ple, opening, blending and bale storage) areas. cks of this type are also considered suitable for use yard areas and inside buildings with generally combustible occupancies such as foundries, sheet l working and machine tool shops.

he use of this equipment in hazardous locations, as ified by Article 500 of the National Electrical Code ection 32 of the Canadian Electrical Code is often the ject of individual consideration. In general, how- r, internal combustion engine powered trucks are not idered safe for use in occupancies involving paint ing and application, storage of flammable gases and uids, solvent recovery, paper and cloth coating using mable solvents in closed equipment, grain, starch wood flour processing, opening, blending and carding otton and some processes in cordage plants.

pproved trucks are equipped with a suitable flame ester on the carburetor air intake and many have an roved fill and vent fitting on the fuel tank. The fuel k and fuel lines are constructed to minimize possibili- of mechanical injuries which might cause fuel leakage arranged so that spilled fuel will not readily contact ition sources on the truck. The electrical systems are structed and arranged to prevent accidental arcs and rks. The exhaust systems conform to Factory Mutual uirements which call for rugged construction and safe angement to minimize danger of igniting ordinary bustible materials such as rubbish or refuse, includ- shredded paper.

ance Floor Machine Co Spring Park Minn
Floor Cleaners. Models 21B, 24B, 24E.

e-Clairaux Mfg Co Engine-Material Handling Div Milwaukee 1 Wis
Type G Trucks. Models F30-24, -24PS, 40-24, -24PS, 50-24, PS, 60-24, -24PS, -24-2PS, 70-24, -24PS, -24-2PS, 80-24, -24PS, -24-2PS, 100-24, -24-2PS, 120-24, -24-2PS, FS60-24, -24PS, -24-2PS, 70-24, -24PS, -24-2PS, 80-24, -24PS, -24-2PS; FT20-24, -24PS, 25-24, -24PS, 30-15, -24, 40-18, -20, -24, 50-24, 60-24, 70-24, 80-24, 100-24; FTB30-15, -15PS, -24, -24PS, 50-24; FTOH60-24; FTP20-34, -34PS, 30-24, -24PS, 40-24, 60-24; FTS60-24.

Type G Tractors. Models HA-75, -90, -120; HB-75, -90, -120; TG-24, -30.

Type D Trucks. Models FD30-24, -24PS, 40-24, -24PS, 50-24, -24PS, 60-24, -24PS, -24-2PS, 70-24, -24PS, -24-2PS, 80-24, -24PS, -24-2PS, 100-24, -24-2PS, 120-24, -24-2PS; FSD60-24, -24PS, -24-2PS, 70-24, -24PS, -24-2PS, 80-24, -24PS, -24-2PS; FTBD50-24; FTD30-15, -24, 40-18, -20, -24, 50-24, 60-24, 70-24, 80-24, 100-24; FTDOH60-24; FTDS60-24; FTPD30-24, 40-24, 60-24.

Type D Tractors. Models HAD-75, -90, -120; HBD-75, -90, -120; TD-24, -30.

Automatic Transportation Co 101 W Eighty-Seventh St Chicago 20 Ill
Fork Lift Trucks. Models GLF-40, -50, -60, -70, -80, -90, -100. Combination gasoline-electric.

Baker Industrial Trucks Div of Otis Elevator Co 1230 W 80th St Cleveland 2 O
Fork Lift Trucks. Models FGA-030-002, FGD-020-002, FGF-020-002, FGA-050-002, FGD-040-006, FGD-030-003, FJA-050-001, FJD-040-001, FJD-030-001, FGF-030-002, FGF-040-002, FJF-030-001, FJF-040-001, FGA-070-001, FGD-060-001, FGD-050-001, FGA-070-002, FGD-060-002, FGD-050-002, FJA-070-002, FJD-060-001, FJD-050-001.

Gas-O-Matic Fork Lift Trucks. Models FD-30, -40, -50, -60. Combination gasoline-electric.

Clark Equipment Co Battle Creek Mich
Tructractor, Truckloader 1024, Clarkette 5, Clarktor, Clarkat, Carloader, Utilitrux, Clipper, Yardlift Y-20, Y-40, Y-60, Y-80, Y-100, CY-20, CY-40B, CY-50B, CY-150, CY-165, CY-180S, CY-180L, CY-200, CFY-150, CFY-165, CFY-180S, CFY-180L, CFY-200, Scoop, Clarklift C20B, C20B Textile, C25B, C30B, C40B, C50B.

Finnell System Inc Elkhart Ind
Floor Scrubber Machines. Models 215G-2, 218G. Gasoline-powered.

Hyster Co 2902 N E Clackamas St Portland 8 Ore
Trucks and Tractors. Models S20A, S25A, H20E, H25E, VA-70, High Lift VA-70, VE-30, VE-30T, YE-40, YE-40T, HE-50, HE-50T, XA-60, High Lift XA-60, ZA-60, High Lift ZA-60, YT-40, UC-30, High Lift UC-30, YC-40, High Lift YC-40, UC-30T, High Lift UC-30T, YC-40T, High Lift YC-40T, HC-50, High Lift HC-50, HC-50T, High Lift HC-50T, RT-100, RT-120, RC-150, RC-160, SC-180, TC-200, Turret Power Unit 2A, Karry Krane KD.

Towmotor Corp 16100 Euclid Av Cleveland 12 O
Fork Lift Trucks. Models 350, 391, 400P, 410, 421, 440, 461, 461D, 1461, L461D, 501, 501D, 501P, 501PD, L501P, L501PD, 540, 540D, 590, 600, 600D, 600P, 600PD, 670, 670D, 680P, 680PD, 900.

Tractors. Models K5-30, K5-33, K5-36, K5-40.

Yale & Towne Mfg Co Philadelphia Div Philadelphia 15 Pa
Fork Lift Trucks.

NEED CLOSE TO EDGE

G3 Series. Models G3P-150-*-UF, G3P-165-*-UF, G3P-180-*-UF, G3P-200-*-UF. (* indicates insert F, C, R, F, A, or S.)

G5 Series. Models G5-150, G5-165, G5-180, G5-200, G5-220.

51 Series. Models KG51-*-UF, KGA51-*-UF, KGP51-*-UF, KGR51-*-UF, KGS51-*-UF, KGPA51-*-UF, KGSA51-*-UF, KGPR51-*-UF, KGSR51-*-UF. (* indicates insert A, T, AT, LT, ATJ or TJ followed by 30, 40, 50, 60, 70, 80 or 100.)

52 Series. Models G52-*-UF, GC52-*-UF, GH52-*-UF, GP52-*-UF, GR52-*-UF, GCR52-*-UF, GHR52-*-UF, GPH52-*-UF, GPR52-*-UF. (* indicates insert A, LT, T, U, or V followed by 2015, 2024, 3024 or 4015.)

G54C Series. Models G54C-030-*-UF, G54C-040-*-UF, G54C-050-*-UF. (* indicates insert NAS, NAD, NAT, NBS, NBD or NBT.)

G54P Series. Models G54P-030-*-UF, G54P-040-*-UF, G54P-050-*-UF. (* indicates insert CAS, CAD, CAT, CBS, CBD or CBT.)

Tractor Shovel. Models Y18P-25-CR-*-UF, Y18P-25-CF-*-UF, Y18P-25-CA-*-UF. (* indicates insert A, B, C, D, E, F or S.)

INDUSTRIAL TRUCKS, Type GS, Gasoline-powered

Type GS trucks are similar in appearance to Type G but are provided with additional or special fire safeguards. Well maintained GS trucks are acceptable in certain areas where G trucks would not be recommended. An example is Class II, Division 2 (bagged grain handling, plastics grinding, etc.).

Hyster Co 2902 N E Clackamas St Portland 8 Ore
Models S30A, S25A, H20E, H25E.

Towmotor Corp 16100 Euclid Av Cleveland 12 O
Fork Lift Trucks. Models 301, 400P, 410, 421, 440, 461, L461, 501, L501, 501P, 590GS, 600P.

Yale & Towne Mfg Co Yale Materials Handling Div Philadelphia 15 Pa
Fork Lift Trucks.
51 Series. Models KG51-*-GS, KGA51-*-GS, KGP51-*-GS, KGPA51-*-GS, KGPR51-*-GS, KGR51-*-GS, KGS51-*-GS, KGSA51-*-GS, KGSR51-*-GS. (* indicates insert A, AT, T, or LT followed by 30, 40, 50, 60, 70, 80 or 100.)
52 Series. Models G52-*-GS, GA52-*-GS, GCA52-*-GS, GC52-*-GS, GCR52-*-GS, GP52-*-GS, GPA52-*-GS, GPR52-*-GS, GR52-*-GS, GH52-*-GS, GHA52-*-GS, GHT52-*-GS, GPH52-*-GS, GPHA52-*-GS, GPHR52-*-GS. (* indicates insert A-LT, T, or V followed by 2024, 3024, or 4015.)
Tractor Shovel. Models Y18-25-CR-*-GS, Y18P-25-CF-*-GS, Y18P-35-CA-*-GS. (* indicates insert, A, B, C, D, E, F, or S.)

INDUSTRIAL TRUCKS, Type LP, LP-gas-powered

LP-gas-powered trucks differ from gasoline- or diesel-powered trucks primarily with respect to the fuel system. This includes a single container which may be either fixed or portable and replaceable, the fuel line and auxiliaries such as filter, hydrostatic relief valve and solenoid valve, and the liquid-vapor conversion. The solenoid valve in the fuel line is electrically interlocked with a pressure-sensitive switch to open only when the engine is cranking or running. These devices and their arrangement are necessary not only in the interests of safety but also to make LP-gas a practical fuel for truck power.

As with gasoline- or diesel-powered trucks, Factory Mutual approved LP-gas-powered trucks are designed so that the fire hazard associated with operation and refueling is minimized. In addition, because the LP-gas truck presents in effect a small scale LP-gas storage system, suitable safety devices such as pressure relief valves and excess-flow check valves are provided.

Because LP-gas trucks employ an internal-combustion engine, they are, from the fire-protection standpoint, essentially the same as gasoline- or diesel-powered trucks.

Allis-Chalmers Mfg Co Engine-Material Handling Div Milwaukee 1 Wis
Models FL30-24, -24PS, 40-24, -24PS, 50-24, -24PS, -24-2PS, 70-24, -24PS, -24-2PS, 80-24, -24PS, -24-2PS, 100-24, -24-2PS, 120-24, -24-2PS; FSL60-24, -24PS, -24-2PS, -24PS, -24-2PS, 80-24, -24PS, -24-2PS; FTL30-24, -24PS, -24PS, 30-15, -24, 40-18, -20, -24, 50-24, 60-24, 70-24, 100-24; FTBL30-15, -15PS, -24, -24PS, 50-24; FTOHL FTPL20-24, -24PS, 30-24, -24PS, 40-24, 60-24; FTL20-24,

Automatic Transportation Co 101 W Eighty-Seventh St Chicago 20 Ill
Fork Lift Trucks. Models GLF-40LP, -50LP, -60LP, -80LP, -90LP, -100LP. Combination LP-Gas-Electric.

Baker Industrial Trucks Div of Otis Elevator Co 1239 W 6th St Cleveland 2 O
Fork Lift Trucks. Models FID-020-002, FIA-030-002, FIF-030-002, FID-030-002, FMD-030-001, FIF-030-002, FMF-030-002, FMD-040-001, FIF-040,002, FMF-040-001, FID-050-001, FIA-050-002, FID-050-001, FID-050-002, FMD-050-002, FID-060-001, FID-060-002, FMD-060-001, FIA-070-001, FIA-070-002, FMA-070-001.

Clark Equipment Co Battle Creek Mich
Clarklift Models C20B, C20B Textile, C25B, C30B, C50B, Clark Carloader, Yardlift -20, -40, -60, CY-20, CY40B, CY50-B, CY-150, CFY-150, CY-165, CFY-165, CY-CFY-180S, CY-180L, CFY-180L, CY-300, Scoop, Clipper, -60, -70, -80, -100, Stevedore.

Finnell System Inc Elkhart Ind
Floor Scrubber Machines. Models 215-G-LP, 218-G-LP.

Hyster Co 2902 N E Clackamas St Portland 8 Ore
Lift Trucks. Models UC-30-LP, HC-50-LP, YC-60-XA-60-LP, ZA-80-LP, UE-30-LP, UE-30T-LP, YE-40-YE-40T-LP, HE-50-LP, HE-50T-LP, VA-70-LP.
Models RC-150-LP, RC-160-LP, SC-180-LP, TC-200-LP.

Towmotor Corp 16100 Euclid Av Cleveland 12 O
Models LT50LP, LT56LP, LT60LP, LT62LP, LT72LP, 90
Fork Lift Trucks. Models 350LP, 391LP, 400PLP, 421LP, 440LP, L461LP, 461LP, L500PLP, 501LP, L501P, 501PLP, 540LP, 590LP, 600LP, 600PLP, 670LP, 690PLP.
Tractor. Model K5LP.

Yale & Towne Mfg Co Yale Materials Handling Div Philadelphia 15 Pa
Fork Lift Trucks.
G3 Series. Models L3P-150-*-UF, L3P-165-*-UF, L3P-180-*-UF, L3P-200-*-UF. (* indicates insert F, C, R, F, A, or S.)
51 Series. Models L51-*-UF, LA51-*-UF, LR51-*-UF, L51-*-UF, LSA51-*-UF, LSR51-*-UF, LP51-*-UF, LPA51-*-UF, LPR51-*-UF, (* indicates insert A, AT, or T followed by 30, 40, 50, 60, 70,

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...ries. Models LS2-*-UF, LA52-*-UF, LR52-*-UF, LC52-*-UF, LCA52-*-UF, LCR52-*-UF, LP52-*-UF, LPA52-*-UF, ...52-*-UF. (* indicates insert A, T, or LT followed by 2024, ...or 4015.)

...ctor Showrm. Models Y18P-25-CR-*, Y18P-25-CF-*, ...-25-CA-*, T18P-25-CR-*, T18P-25-CF-*, T18P-25-CA-*. ...ates insert A, B, C, D, E, F, or S.)

...USTRIAL TRUCKS, Type LPS, LP-gas-powered

...e LPS trucks are the LP-gas-powered counter-...s of the Type GS gasoline-powered trucks.

...ter Corp 16100 Euclid Av Cleveland 12 O
...t Lift Trucks. Models 291LP, 400PLP, 421LP, L461LP, ..., 501LP, L501PLP, 501?LP, 540LP8, 590LP8, 600LP8, ...LP, 670LP8, 680PLP8.

...USTRIAL TRUCKS, Type EE, Electric-battery-powered

...ectric-battery-powered trucks of Type EE con-...tion are provided with fire-protection safeguards ...h permit their use in many hazardous locations as ...ified in Article 500 of the National Electrical Code ... Section 32 of the Canadian Electrical Code. Type ... trucks can be considered spark-enclosed but they ... not explosionproof or dusttight and must not be ... in hazardous locations requiring such equipment. ... general, Type EE trucks may be used in locations ...ified as Class I, Division 2 (paint spraying or ...ing, solvent recovery, rubber-cement mixing), ...s II, Division 2 (grain handling in bags or closed ...tainers), and Class III, Division 1 (storage of textile ... cordage fibers, excelsior, kapok or Spanish moss). ...losionproof trucks (Type EX) are required or pre-...ed in Division 1 conditions of Classes I and II. ...Careful maintenance is a more-than-ordinary require-...nt for Type EE equipment. The design and construc-...n provide adequate spark-enclosed characteristics. ...releasness on the user's part regarding covers, ...kets, etc., can nullify the fire-protection advantages ...this design.

...ndle Transportation Co 101 W 87th St Chicago 20 Ill
...Models BF-20, BF-30, BF-40, LF8-40, LF8-50, LF8-60. ...Models FPE, PE, P, PR, PRE, TN, TNE, TW, TWE, T8, T8E, ...THE, T8HE, SPL, SPLL, SPH, T8SE, TET, TETH, TETT, ...80, 80, 80T, 8S, 8ST, CXA, CLA, CXTA, CLTA, CXB, CLB, ...T8, CLT8, TR, TRH, TRL, TRLE, TBE, CR, SCX, SCL, ...LT, SCXH, SCLH, SCLTH.

...ne Industrial Trucks Div of Otis Elevator Co 1250 W 80th St ...Cleveland 2 O
...Models FTD-020-006, FTA-020-004.

Lewis-Shepard Co 125 Walnut St Watertown 72 Mass
Models Nos. EFT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, -Multi; EFTT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, -Multi; EFFTT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, Multi.

Raymond Corp Greene N Y
Models EE4RT, EE4RTT, EE4ST, EE4STT, EE5ST, EE5STT, EE6ST, EE6STT.

Yale & Towne Mfg Co Yale Materials Handling Div Philadelphia 15 Pa
Models K51A, K51T, K51AT.
Model M Series.

INDUSTRIAL TRUCKS, Type E, Electric-battery-powered

Type E battery-powered trucks have the minimum required safeguards and are generally considered suitable for use in ordinary-hazard occupancies only. In certain cases where good maintenance is assured, a Type E truck may be satisfactory for use in occupancies of Class II, Division 2 and Class III, Divisions 1 and 2 (Article 500, National Electrical Code; Section 32, Canadian Electrical Code). For use in other than an ordinary-hazard area, consult the Factory Mutual Engineering Division.

Baker Industrial Trucks Div of Otis Elevator Co 1250 W 80th St Cleveland 2 O
Model FTD-020-003.

Finnell Systems Inc Elkhart Ind
Scrubber-Vacuum Machines. Models Mark 20, Mark 26.

Lewis-Shepard Co 125 Walnut St Watertown 72 Mass
Models Nos. EFT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, -Multi; EFTT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, -Multi; EFFTT-1, -2, -2.5, -2S, -3, -3H, -4, -4H, -4S, -5O, -61, -Multi.

Raymond Corp Greene N Y
Models E4RT, E4RTT, E4ST, E4STT, E5ST, E5STT, E6ST, E6STT.

DISCONNECT SWITCH for Vehicles

The electric-system disconnect switch is intended to disconnect the battery from a vehicle's electrical system as well as to break the generator-field circuit when the vehicle is not in use or in the event of an emergency. The system may be operated manually by push button or automatically in the event of vehicle upset.

Rochester Mfg Co 100 Rockwood St Rochester 10 N Y
Mak-Saf System. Consists of a 2832 panel, 2830 solenoid switch and a 2831 tip-over switch. A 2833 solenoid valve for the fuel line is available as an optional extra.

NTED CLOSE TO EDGE

INDIVIDUAL CLASSIFICATIONS

WATCHMAN'S CLOCKS

Approved watchman's clocks provide a permanent record of the watchman's tours.

The stationary type of watchman's clock is installed at a central location with electric wiring extending from the clock to various stations throughout the plant. The watchman carries a small crank-type key which he inserts in each station box along his tour. Turning the key operates a small magneto which generates sufficient current to actuate a recording mechanism in the central clock and indicate the station and time.

Detex Watchclock Corp 4147 Ravenswood Av Chicago Ill
Eco Magneto Stationary Clock. 12- and 24-hour circular dial. 48- and 72-hour rectangular dial.

The portable clock is carried with a shoulder strap. At each station the watchman inserts and turns a key which is permanently secured to the station. This records the station number on a paper dial or tape in the clock, recording the station and the time visited. Dials cover a twenty-four hour period unless otherwise specified. Clocks are designed for twenty, thirty, or an unlimited number of stations. When a clock is opened or closed for any purpose, this is indicated on the dial or tape so that tampering is readily detected.

Detex Watchclock Corp 4147 Ravenswood Av Chicago Ill
Alert, Eco, Newman, Patrol, Guardsman Wide-tape Model, Chicago Spartan, Chicago Minute Man, Chicago Comet.

Hardinge Bros of Canada Ltd 601 Merton St Toronto 7 Ont
Alert. Patrol.

Lathem Watchman's Clock Co 76 Third St N W Atlanta Ga
Lathem.

Morse Magneto Clock Co 15 High St W Haven Conn
Morse. Tape-type.

Simplex Time Recorder Co Sanborn St Gardner Mass
Simplex.
Ingus. Dial and narrow-tape types.

WASTE CANS

Good housekeeping is essential to fire safety. Approved waste cans should be provided at convenient locations to help minimize the hazard of oil- or solvent-soaked wiping cloths, paper towels, and refuse. At the end of each normal working period these containers should be emptied and the accumulated waste burned in the plant incinerator or disposed of in some other safe manner.

These cans are made of sheet metal with self-cl
tightly fitting covers. When oily waste and refu
placed in them, any fire which starts from spon
ous ignition or other cause is confined inside th
so that it does not ignite the surroundings. The bo
of the can is raised so that heat from a fire in the ca
not ignite a wooden floor or other combustible

Eagle Mfg Co Wellsburg W Va
Waste cans. Model Nos. 906 (6 gal), 910 (10 gal), 914 (
921 (21 gal). Without foot lever.
Waste cans. Model Nos. 906-FL (6 gal), 910-FL (
914-FL (14 gal), 921-FL (21 gal). With foot lever.

Justrite Mfg Co 2061 N Southport Av Chicago 14 Ill
Justrite Waste Cans. Models 9-100 (5 gal), 9-200 (
9-500 (14 gal). With foot lever.
Justrite Waste Cans. Models 9-110 (6 gal), 9-210 (
Without foot lever.

Polis Mfg Co 2900-20 W 26th St Chicago 23 Ill
Safeway Excelsior Storage Bins. Cat Nos. 1-B (1 bale
(2 bale), 2-B (3 bale). Heavy swivel-base casters are furn
when specified.
Safeway Towel Bin. Cat No. St-1. Heavy swivel-base ca
are furnished when specified.

Protectoseal Co 1920 S Western Av Chicago 8 Ill
Protectoseal Waste Cans. Cat Nos. 1401 (6 gal), 1402
1403 (10 gal), 1404 (14 gal). With foot lever.
Protectoseal Towel Dispenser Disposal Station. Model

Safety Supply Co 214 King St E Toronto 2 Ont
Protectoseal Waste Cans. Cat Nos. 1401 (6 gal), 1402 (
1403 (10 gal), 1404 (14 gal). With foot lever.
Protectoseal Towel Dispenser Disposal Station. Model

Witt Cornice Co 4454 Steel Place Cincinnati 9 O
Witt Corrugated Waste Cans. Sizes A to G. Hand-oper
AF to GF foot-operated.

WATERPROOF COVERS

Waterproof covers are recommended for the pro
tion of high-value storage and machinery a
damage from water leakage through upper floo
might occur when sprinklers operate, or hose str
are used during a fire, or when rain enters thr
broken windows or unroofed sections during a w
storm.

Covers are usually 12 x 18 ft or 14 x 16 ft. Spe
sizes up to 24 x 36 ft are available for textile car
machines. Approved commercial grades are mad
rubber-coated canvas or canvas treated with a wa
proofing preparation. These covers should be refol
at least once a year to prevent the breaking of t
fibers at the folds. They will give good service for y

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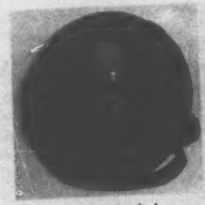


Watchman's clock.

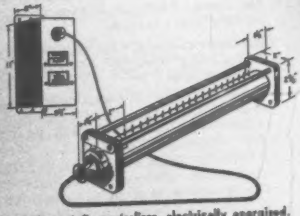
Watchman's station.

Fire-resistive fabric.

Waste can.

Waterproof covers.

Light switch.

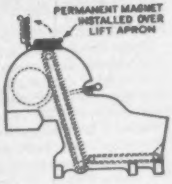


Electrostatic neutralizer, electrically energized.

Electrostatic neutralizer, induction type.

Magnetic separator, permanent-magnet pulley type.

Magnetic separator, permanent-magnet hump type.



TED CLOSE TO EDGE

if kept in a cool dry location, well away from moisture. They should be completely dried after each use.

Night watchmen and responsible plant employees on all shifts should be instructed in the purpose and use of the covers. Prompt covering of stock and machinery during the early part of a fire — before leakage starts coming through into the lower stories — will often save many times the small investment involved.

Fulton Cotton Mills 170 Boulevard S E Atlanta Ga
Shuredry Green-Bak.

Fyr-Fyter Co 221 Crane St Dayton 1 O
Fyr-Fyter.

FIRE-RESISTIVE FABRICS

Approved fire-resistive fabrics are available for use as awnings, as curtains or screens to confine sparks during cutting and welding operations, as tarpaulins in reinforced-concrete construction, and for any other purpose for which such a fabric may be desired.

Canvas fabric chemically treated for flame-retardance, is available either with or without a decorative paint coating as used in awnings. It is comparatively difficult to ignite and does not propagate flame beyond the area exposed to a source of ignition. The fire-resistive treatment may be expected to remain effective under ordinary conditions of exposure for the useful life of the fabric.

Farrington Textel Corp 2000 Main St Walpole Mass
Super Tuff-Tarp Vinyl Coated Nylon. Quality SHW230.

Wm E Hooper & Sons Co Baltimore 11 Md
Fire Chief Weather-resistant Canvas.

MAGNETIC SEPARATORS

Magnetic separators are desirable protection for all textile opener lines and waste-recovery systems. Removing ferrous foreign material helps control one of the most common causes of fire in textile preparatory processes. Magnetic-separator protection should be arranged so that stock impinges on the separator plate or is directed to come within the effective magnetic field.

Eriez Mfg Co Erie Pa
Hump Permanent-magnetic Separator. Two Alnico V heavy-duty magnets, mounted one above and one below a hump-shaped duct section. For installation between feeder and first opener. May incorporate ATOmagnet types Extra Power, Ultra-Power, Super Power, or Giant, as applicable.

Alnico V Heavy-duty Magnets. For installation above spiked lift apron of textile feeder which feeds directly to pickers, garnetts or cards, where preparatory equipment does not include intervening feed tables, openers, or cleaners. Magnets should extend entire width of apron at a distance of not less than 1½ in. nor more than 3 in. Magnets should be installed 2 in. forward of dead center of the upper lift-apron pulley.

Permanent-magnet Pulleys. 12 in. diameter and up, for belt widths 12 in. and up. Approved for fiber depths not exceeding 5 in. when driven at not more than 60 rpm.

Metal Katcher Co Box 43 Cherokee Sta Louisville Ky
Regular and Hi Power Permanent Magnets.

LINTTIGHT SWITCHES

Linttight switch enclosures are designed partic[ularly] for locations where the fire hazard is serious beca[use of] the presence of combustible lint. In order to ga[in the] benefit of the linttight characteristics, each enc[losure] must be installed with more than usual care to pr[event] lint entry at conduit- or cable-entry points and m[ounting] ing holes.

Allen-Bradley Co Milwaukee 4 Wis
Loom Motor Switch. Bul 1209.
Speed Plugging Switch. Bul 808. With or without lock[ing]

Arrow-Hart & Hegeman Electric Co 103 Hawthorn St Ha[rtford]
6 Conn
Cat No. LM-032. Rated for 1½ max hp at 110v, or 3 [hp at] 220, 440, or 550v.

Cutler-Hammer Inc 315 N 12th St Milwaukee Wis
Bul Nos. 9115H150A, 9115H150A. Size 0. Manual s[tarter] type. A-c. Max ratings from 1 hp at 110v, single-phase to [3 hp at] 230-550v 2- or 3-phase.

General Electric Co Bloomington Ill
Cat Nos. CR1062-M7B, CR1062-M31B. Manual starter[s.] A-c. Max ratings 1½ hp at 110v, 2 hp at 220v, 3 hp at 440 [to] 2- or 3-phase.

Square D Co Industrial Controller Div 4041 N Richa[rds]
Milwaukee Wis
Class 2510. Types RA-1 through RA-6 (N E M A size 0). [Types] SA-1 through SA-6 (N E M A size 1). Available with ra[tings] 110-600v, from 1 to 7½ hp.

Westinghouse Electric Corp Beaver Works Beaver Pa
Class 10-100 VOA. Size 0. 1½ hp at 110v, 2 hp at 220[v,] 2 hp at 440-600v.
Class 10-100 VI. Size 1. 3 hp at 110v, 5 hp at 220[v,] hp at 440-600v.
Class Nos. 11-206NV0, 11-206NV1, 11-206NV2. For [use] from 110 through 600 at 25, 50, 60 cps. Max ratings 3, 5, 7½
Class Nos. 10-100J0 (NEMA size 0), 10-100J1 (NEMA [size] 12 enclosures. Ratings of size 0: 1 hp at 115v, 1½ hp at [230v] 2 hp at 440-600v, single phase; 1½ hp at 110v, 2 hp at 220v, [3 hp] at 440-600v, polyphase; 1 hp at 115v, 1½ hp at 230v d-c. [Ratings] of size 1: 1½ hp at 115v, 3 hp at 230v, 5 hp at 440-600v, [single] phase; 3 hp at 110v, 5 hp at 220v, 7½ hp at 440-600v, [polyphase] 1½ hp at 115v, 2 hp at 230v d-c.

INTRINSICALLY SAFE SWITCHES, for Hazardous Atmospheres

Electrical switching in hazardous atmospheres can be accomplished safely with general purpose switches [if] even exposed contacts provided the design of associated control equipment is such that the electrical spark energy available at the switch is less than required to ignite the surrounding atmosphere. Equipment of this type is said to be classed as "intrinsically safe" and is recognized in Article 500 of the National Electrical Code.

The associated control equipment must be located in a non-hazardous atmosphere even though the remotely connected actuating switch may be in a hazardous

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sphere. Further, to prevent flammable products eling from the hazardous location to the control, a ible vapor seal must be installed in the connecting g and any partition opening plugged.

ower Corp 26 Burrush St Boston 26 Mass
Intrinsitrol Intrinsic Safety Switch Controller. Used with intel general-purpose SPST switch. The Intrinsitrol is an ic control cabinet powered by 115v 60 c which, acting as a tor, is located in a nonhazardous atmosphere. It is actuated remote electrically connected general-purpose switch which e located in a hazardous atmosphere (Class I, All Groups). ntrolled load rating is 5 amp noninductive at 115v 60 c. ufacturer's installation instructions must be followed.

CTROSTATIC NEUTRALIZERS

ectrostatic neutralizers and collectors are used to ralize static electricity generated on paperworking, ic, and similar machinery.

ere are two general types. One is the induction rostatic collector which is normally mounted across width of the belt, sheet, or other moving equipment, the wire tuft ends ¼–½ in. above it.

he other type is an electrically energized neutralizer nded for permanent installation, designated for use 10-125v a-c circuits, and consists of a power supply, necting cable and neutralizer bar. Where hazardous ids or gases are present these devices are acceptable on the basis of special study and on the assurance ellent maintenance of the equipment.

ort Products Inc Linden Av Westbury N Y
gy Cold Bars Energized Static Neutralizers. Type OX. transformer Type OX102, -102B, -230A, or -230B.

ro Co 660 Walnut St Lansdale Pa
rgized Static Eliminators. Consist of Shockless Bar Type Midget power unit SR (1, 2, 4, or 5) (2, 5 or 6) (7 or 8)c, connecting cable.
tic Neutralizing and Air-cleaning Assemblies. Midget power Model D1682. With Neutrostat Shockless Ionising Air Model 1808 or Shockless Ionising Air Nozzles Model 8. duction Type Static Eliminators. Types IL and IS.

Shield Co 27 Park Pl New York 7 N Y
agic Wand Induction Electrostatic Neutraliser. Single-bar ths up to 100-in. overall, 96-in. tuft span. More than one may nnected together for longer requirements. Wire no smaller . No. 8 (preferably No. 4) should be used for ground con-ions.

t Corp Newark O
AKK Energized Static Neutralizers.

TATIC METER

The static meter is a battery-powered, hand instrument to indicate the presence of static electricity. Its industrial application is to determine whether or not static-producing machinery or operations are properly ounded. It is calibrated "go" and "no go", the ter indicating an unsafe or potentially unsafe con-ion because of inadequate grounding.

B K Sweeney Mfg Co 5300 E 44th Av a Monaco Blvd Denver 16 Col
Static Meter. Model No. 1125.

GAS MASKS

Gas masks are available for use by plant fire brigades and other specially trained personnel, as protection against smoke, industrial gases, and fumes. Three types are described and listed: the industrial canister-type mask, the hose mask, and the self-contained breathing apparatus.

The listings include the Bureau of Mines approval number, indicated by the letters BM before the number. The specified limitations of each type is indicated on the Bureau of Mines approval plate which accompanies each complete gas-mask unit. Personnel should become thoroughly familiar with the operating instructions and caution notes, which are also included on the approval plate.

Masks are often provided for use only in case of emergency. This means they are not used for long periods of time and may be neglected. All masks should be inspected for defects and tested for tightness at least every six months. The pressure-gage reading on the cylinder-type breathing masks should be checked periodically and if the pressure has dropped considerably since the previous inspection, the valve should be checked for tightness and the cylinder recharged.

Gas masks should always be stored or mounted outside the hazardous area. Where men are working in gas masks, extra masks should be available for rescue or other emergency services.

GAS MASKS, Industrial Canister Type

Industrial canister-type masks have no supply of air or oxygen. They are limited to use in atmospheres containing 16% or more oxygen and where concentration of poisonous gas or vapor is not suspected to be greater than the limitation stated on the canister approval plate. This limitation is usually not greater than 2% total gases. Time-service limitations are usually one to two hours.

American LaFrance Elmira N Y
Protexall Gas Mask. For all gases including carbon monoxide, smokes, fumes, mists, and dusts. Cat No. 4M-1914. (BM-1434).
LaFrance Industrial Gas Mask. For ammonia. Cat No. 4M-1770. (BM-1406).

Davis Instruments Div of Davis Emergency Equipment Co Inc 45 Halleck St Newark 4 N J
M-; Gas Mask. For use with 650 cc canisters. Organic vapors, Cat No. 4101 (BM-1417). Ammonia, Cat No. 4103 (BM-1408). Chlorine, Cat No. 4115 (BM-1437). Hydrocyanic acid, Cat No. 4107 (BM-1424).
M-O Gas Mask. For use with 2000 cc canisters. Organic vapors and acid gases, Cat No. 4124 (BM-1411).

ITED CLOSE TO EDGE

Gas mask, industrial canister type.

Breathing apparatus, self contained.

Hose mask

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh 8 Pa

Organic Vapor Industrial Mask. With Clearvue facepiece ED-84004, canister ED-3045. (BM-1415).

Organic Vapor Super Size Mask. With Clearvue facepiece EF-84070, canister EF-3101. (BM-1441).

Ammonia Industrial Mask. With Clearvue facepiece EE-84006, canister EE-72429. (BM-1449).

Ammonia Super Size Mask. With Clearvue facepiece EF-84069, canister EF-5286. (BM-1442).

Chlorine Industrial Mask. With Clearvue facepiece ED-84005, canister ED-15303. (BM-1422).

Hydrocyanic Acid Industrial Gas Mask. With Clearvue facepiece ED-84059, canister ED-3055. (BM-1413).

Standard All-Service Gas Mask. With Clearvue facepiece EA-83999, canister EA-3107. (BM-1405).

Model S All-Service Gas Mask. With Clearvue facepiece EA-84000, canister EA-40654. (BM-1434).

Model S All-Service Windo-Cator Mask. With Clearvue facepiece EA-83998, canister EA-81225. (BM-1434A).

Mine Safety Appliances Co of Canada Ltd 500 MacPherson Av Postal Station E Toronto Ont

See listing of Mine Safety Appliances Co., Pittsburgh.

Safety Supply Co 214 King St E Toronto 2 Ont

Willson Universal Gas Mask. For all gases including carbon monoxide, WUG-N1. (BM-1443). For all gases including carbon monoxide, and for smoke WUG-N2. (BM-1445).

Willson Industrial Gas Mask. For organic vapors, WIG-G1 (BM-1423), WIG-LG1 (BM-1437). For ammonia, WIG-G4 (BM-1425), WIG-LG4 (BM-1438). For hydrocyanic-acid gas, WIG-G7 (BM-1428). For chlorine, WIG-G8 (BM-1426). For toxic dusts, fumes, mists, fogs, and organic vapors, WIG-LG1-G (BM-1446). For acid gas and organic vapors, WIG-LG3 (BM-1450). For toxic dusts, fumes, mists, fogs, and acid gas and organic vapors, WIG-LG3-G (BM-1451). For hydrogen sulfide and petroleum vapor, WIG-LG9 (BM-1444).

Willson Products Div Ray-O-Vac Co Second and Washington Sts Reading Pa

Universal Gas Mask. For all gases including carbon monoxide, WUG-N1 (BM-1443). For all gases including carbon m and for smoke, WUG-N2 (BM-1445).

Industrial Gas Mask. For organic vapors, WIG-G1 (B WIG-LG1 (BM-1437). For ammonia, WIG-G4 (B WIG-LG4 (BM-1438). For hydrocyanic-acid gas, W (BM-1428). For chlorine, WIG-G8, (BM-1426). For to fumes, mists, fogs, and organic vapors, WIG-LG1-G (B For acid gas and organic vapors, WIG-LG3 (BM-1450). dusts, fumes, mists, fogs, and acid gas and organic vapo LG3-G (BM-1451). For hydrogen sulfide and petroleu WIG-LG9 (BM-1444).

HOSE MASKS, Supplied-air Respirat

Hose masks supply fresh air continuously respirators through a hose attached to the rub covering. They are operated by natural br when hose lengths do not exceed twenty feet. lengths require a blower operated by hand o power. These devices have no time limit but th ing range of the wearer is governed by the of hose.

Davis Instruments Div of Davis Emergency Equipme 45 Halleck St Newark 4 N J

Hose Mask. BLS. With double inhalation tube. (B

Hose Mask. DSI. With single inhalation tube. (BM

Mine Safety Appliances Co 201 N Braddock Av Pitts

Clearvue Facepiece Constant-flow Air-line Respirator. (BM-1909).

Clearvue Facepiece Demand-flow Air-line Respirator. (BM-1922).

Dustfoe Facepiece Constant-flow Air-line Respirator. (BM-1928).

One Man Combination Hose Mask with Clearvue EB-84011. (BM-1905-A).

Two Man Combination Hose Mask with Clearvue EB-84012. (BM-1905-A).

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One Man Utility Hose Mask with Clearvue Facepiece. EB-84010. (BM-1005-A).

Two Man Utility Hose Mask with Clearvue Facepiece. EB-84008. (BM-1005-A).

Mine Safety Appliances Co of Canada Ltd 500 MacPherson Av Postal Station E Toronto Ont
See listing of Mine Safety Appliances Co., Pittsburgh.

Safety Supply Co 214 King St E Toronto 2 Ont
Scott Supplied-air Respirator. Type C Demand-class. Model No. 6380A, 6380B, 6380C, 6380D with modifications J, K, L. (BM-1024).

Scott Aviation Corp Safety Equipment Div 225 Erie St Lancaster N Y
Supplied-air Respirator. Type C Demand-class. Model No. 6380A, 6380B, 6380C, 6380D with modifications J, K, L. (BM-1024).

BREATHING APPARATUS, Self-contained, Air or Oxygen *

Self-contained breathing apparatus generates its own supply of air or oxygen and is approved for respiratory protection in oxygen-deficient atmospheres or in vapors or gases which do not poison by skin absorption, as does, for example, hydrocyanic acid gas. Time-service limitations are usually from ½ to ¾ hour.

Mine Safety Appliances Co 201 N Braddock Av Pittsburgh 8 Pa
One-Half Hour Demand Oxygen Mask with Clearvue Facepiece. B-83816. (BM-1309).
One-Half Hour Demand Air Mask with Clearvue Facepiece. B-83815. (BM-1310).
Three-Quarter Hour Chemox Breathing Apparatus. B-48445. (BM-1307).

Mine Safety Appliances Co of Canada Ltd 500 MacPherson Av Postal Station E Toronto Ont
See listing of Mine Safety Appliances Co., Pittsburgh.

Safety Supply Co 214 King St E Toronto 2 Ont
Scott Air Pak One-half-hour Compressed-air Demand Apparatus. Models 6000-A2M, -A2MS, -A2MST, -A2MSQ with modifications J, K, L, N. (BM-1308).

Scott Aviation Corp Safety Equipment Div 225 Erie St Lancaster N Y
Scott Air Pak One-half-hour Compressed-air Demand Apparatus. Models 6000-A2M, -A2MS, -A2MST, -A2MSQ with modifications J, K, L, N. (BM-1308).

NTED CLOSE TO EDGE

MANUFACTURERS INDEX

Abbotsford Co., Inc., 73
Ace Chemical Co., 48, 49
ACF Industries, Inc., 160
Acme Fire Alarm Co., Inc., 63, 69, 72, 73
Acme Gauge and Instrument Co., Inc., 17
Acme-Hamilton Mfg. Corp., 86
Acme Wood Tank Co., 49
Adams & Westlake Co., The, 113
Adams, Charles, Co., 7
Advance Floor Machine Co., 163
Aeronautical and Instruments Div. Robertshaw-Fulton Controls Co., 99
Agate Sheet Metal Products Co., 90
Air-Maze Corp., The, 86
Air Reduction Co., Inc., 101, 102, 104, 105
Ajax Tank and Tower Co., 49
Akron Brass Mfg. Co., Inc., 90, 91
Alabama Pipe Co., 93
Alarm Signal Co. of Texas, 70
Albany Protective Service, 70
Allan-Jelvis Marine, 49
Allen, W. D., Mfg. Co., 25, 27, 28, 36, 51, 65, 67, 68
Allet-Bradley Co., 110, 140
Allis-Chalmers Mfg. Co., 99, 105, 144
Allith-Prouty, Inc., 89
All-State Welding Alloys Co., Inc., 106
Almer Instrument Co., Div. of Illinois Testing Laboratories, 113
Alsynite Company of America, 94
American Air Filter Co., Inc., 94
American Dilatite Rubber Co. (Canada) Ltd., 98
American Boiler & Tank Co., 86
American Burglar Alarm Div., Pefcide Fire Extinguisher Co., 72
American Cast Iron Pipe Co., 93
American Chain & Cable Co., Inc., R-PsC Valve Div., 17, 18, 99
American Cyanamid Co., 97
American District Telegraph Co., 11, 12, 67, 68, 69, 70, 72, 75, 76
American Fire Dispatch Inc., 70
American Fire Equipment Co., 47, 86
American Foundry and Mfg. Co., 94
American LaFrance, 31, 43, 44, 46, 47, 48, 49, 51, 52, 54, 56, 57, 58, 60, 149
American Liquid Gas Corp., 98, 100
American Machine & Metals, Inc., DeBothezat Fans Div., 94
U. S. Gauge Division, 17
American Metal Door Co., Inc., 93
American Standard Controls Div., 131, 159
Williams, W. T., Valves, 99, 117
American Valve Mfg. Co., 17
Angco Metal, Inc., 96
Angus, George, Canada, Ltd., 25, 27
Ansul Chemical Co., Fire Equipment Div., 42, 44, 48, 49, 56, 97, 99
Lewis-Safety Ltd. (Canadian distributor) 43, 44, 48, 49, 97, 99
Apex Belt Products Co., 7, 8
Approved Equipment Mfg. Co., Inc., 25, 27
Arcall Corp., 47, 53
Arco Expansion Bolt Co., 9
Arrow-Hart & Hegeman Electric Co., 146
Ashton Valve Co., The, 17, 99
Atlantic Tank Corp., 49
Atmo Automatic Fire Alarm Systems (see Kidde Ultrasonic & Detection Alarm, Inc.)
Autocall Co., The, 17, 67, 68, 72, 73, 75
Autopac Company, 134
Automatic Alarm Corp., 70
Automatic Fire Alarm Co., 70, 76
Automatic Fire Alarm Co., Consolidated Fire Alarm Co. Div., 70
Automatic Fire-Alarm Co., 70, 76
"Automatic" Sprinkler Corp. of America, 4, 6, 7, 9, 11, 12, 13, 14, 15, 20, 23, 28, 30, 31, 32, 34, 65, 66
"Automatic" Sprinklers of the Pacific, Inc., 4
Automatic Switch Co., 151, 156, 159
Automatic Timing & Controls, Inc., 113
Automatic Transportation Co., 145, 146, 165

Babcock-Wilcox and Goldie-McCulloch, Ltd., 98
Badger Fire Extinguisher Co., 64, 66, 67, 68, 69, 86
Bailey Meter Co., 129, 154, 162
Baker Industrial Trucks, Div. Otis Elevator Co., 143, 144, 145
Baker Industries, Inc., Pyrotronics Div., 66
Balfour, Walter & Co., Inc., 79
Barber-Colman Company, Wheelco Instruments Div., 117, 119, 125, 127, 130
Barolite Corp. of America, 94
Barksdale Valves, 132
Bar-Way Mfg. Co., 90
Bass Division, Penn Controls Inc., 130
Bastian-Blessing Co., The, 100, 103, 104, 106
Bayley, William, Co., The, 93
Beryllium Corp., The, 96
Bete Fog Nozzle, Inc., 33, 60
Bi-Lateral Fire Hose Co., 86
Bi-Lateral Fire Hose (Canada), 86
Binks Manufacturing Co., 90, 94
Black, Sivalls & Bryson, Inc., 86
Blaw-Knox Co., Automatic Sprinkler Dept., 64
Blaze Guard Mfg. Co., 26, 27
Boston Coupling Co., 90, 91
Boston Metal Door Co., 93
Boston Woven Hose & Rubber Co., 86
Bowman Steel Corp., 94
Boylston Rubber & Chemical Corp., 94
Brinon Mfg. Co., 109
Brown Instrument Div. (see Minneapolis-Honeywell Regulator Co.)
Brulin & Company, Inc., 94
Buffalo Fire Door Co., Inc., 93
Buffalo Pumps, Div. of Buffalo Forge Co., 35, 93
Buffalo Tank Div. of Bethlehem Steel Co., 93
Building Construction Specialties, Corp., 6
Burling Instrument Co., 113
Butler Manufacturing Co., 94

Caldwell, W. E., Co., Inc., 98, 45, 48
Call's Fellos Signal Corp., 70
Cameron Pump Div., Ingersoll-Rand Co., 94, 99
Canada Barrels and Kegs, Ltd., 49
Canada Valve & Hydrant Co., Ltd., 17, 18, 99, 94
Canadian Allis-Chalmers, Ltd., 99
Canadian Controllers, Ltd., 97
Canadian Ingersoll-Rand Co., Ltd., 95, 96
Carbon Div. Chemetron Corp., 48, 56, 60
Carpenter & Paterson, Inc., 7, 9
Cause Products Corp., 49
Case Steel Products Corp., 88
Cataness Corporation of America, 96
Central Alarm Co., 70
Central Automatic Sprinkler Co., Inc., 4, 6, 11, 12, 13, 14, 16, 22, 23, 64
Central Office Alarm Co., Inc., 70
Central Safety Equipment Co., 66
Central Station Alarm Co., 68, 72
Central Station Signals, Inc., 12, 70, 72, 73
Central Watch Service, 70
Chemetron Corp., Carbon Div., 48, 56, 60
National Cylinder Gas Div., 101, 102, 104, 105
Chicago Bridge and Iron Co., 99
Chicago Pump Co., 93
Chicago Wooden Tank Co., 49
Chrysler Corp., 96
Church and Goodhue, 43, 47, 52
Clark Controller Co., 96
Clark Equipment Co., 143, 144
Clayton, E. M., Co., Div. of John W. Mecs, 96, 51
Clayton Manufacturing Co., 143
Cleveland Controls, Inc., 114
Clow, James B. & Sons, Inc., 93
Coburn Products Dept., Whitwice Spencer Steel Div., Colorado Fuel & Iron Corp., 99
Cole, R. D. Mfg. Co., 98, 43
Colorado Fuel & Iron Corp., Coburn Products Dept., 99
Colorado Oil & Gas Corp., Marsh Instrument Co. Div., 17, 132
Combination Pump Valve Co., 51
Combustion Control Div. (see Electronics Corp. of America)
Consolidated Fire Alarm Co., Div. of Automatic Fire Alarm Co., 70
Continental Motors Corp., 96
Conteon Co., The, 79
Coppus Engineering Corp., 99
Cornell Iron Works, Inc., 79
C-O-Two Fire Equipment of Canada, Ltd., 43, 49, 56
C-O-Two Systems Div., The Fyr-Fyter Co., 43
Cook, E. M., Co., Inc., 73
Cramer Controls Corp., 113
Crampton Mfg. Co., Grand Rapids Brass Co. Div., 109
Crane Co., 17, 18, 98, 99
National-U.S. Radiator Div., 154
Pacific Steel Boiler Div., 154
Crane Canada Ltd., 17
Cruiser Fire Prevention Div. (see Fire End & Cruiser Corp.)
C.S.B. Sprinkler Co., 4
Cummins Engine Co., Inc., 96
Custom Built Controls, Inc., 93
Cutler-Hammer, Inc., 98, 145
Cutler-Hammer Canada Ltd., 96

Darling Brothers, Ltd., 93
Darling Valve & Mfg. Co., 17, 18, 99, 94, 99
Davis Instruments, Division of Davis Emergency Equipment Co., Inc., 105, 108, 149, 150
Dayton Electronic Alarm & Signal Inc., 70
Deibelbiss Fire Station Alarm Machine & Metals, Inc., 94
DeLaval Steam Turbine Co., 93
Denver Fire Reporter & Protector Co., Inc., 70
Derby Devices, Inc., 15, 22, 23, 30
Despatch Gun Governor, 109
Detex Watchclock Corp., 163
Detroit Diesel Engine Div., General Motors Corp., 96
Detroit Fire Extinguisher Service Co., 67, 68
DeVilbiss Co., The, 93, 94
Dewey Gas Furnace Co., 113, 114
Diamond Expansion Bolt Co., Inc., 9
Dictograph Products Inc., 67, 70
Diebold, Inc., 93
Dietz, Henry G., Co., 154
Dilley, Porter D., 93
Doyle-Pretzsky Co., 67, 68, 94, 95
Dresser Manufacturing Div., Dresser Industries, Inc., 93
Drive Pin Inc., 10
Drying Systems Co. (see Tice Power Tool Co.)
Dunlop Canada, Ltd., 98
Dunlop & Hunt, Inc., 93, 99

Eagle Mfg. Co., 93, 95, 96, 107
Eagle Signal Corp., 113
Eastern Sales Co., Div. The Eastern Co., 93
Eclipse Air Brush Co., Inc., 93, 94
Eclipse Fuel Engineering Co., 102, 116, 117, 126, 127, 128, 129
Economy Faucet Co., 93
Eddy Valve Co., 17, 18, 99
Edwards Co., Inc., 61, 64, 65, 70
Electric Stop Nut Corp. of America, Elizabeth Div., 109
Elkon Metal Products Co., Inc., 7, 9
Electric Signal Co., Div., Protectowire Co., 70
Electronics Corp. of America, Combustion Control Div., 119, 120, 124, 127, 128, 129, 130, 132, 136, 139
Firepo Div., 66
Electro-Protective Corp., 70
Electro Rust-Proofing Corp., 49
Elizabeth Div. (see Electric Stop Nut Corp. of America)
Elkhart Brass Mfg. Co., 27, 28, 30, 31, 43, 44, 46, 47, 48, 49, 52
Elkhart Rubber Works, 97
Erico Manufacturing Co., 102

Fabric Fire Hose Co., 93
Fairbanks Co., The, 17, 18, 93, 94, 97, 99
Fairbanks, Morse & Co., 93, 94
Farrington Tunnel Corp., 163
Farris Engineering Corp., 99
Fastway Fasteners, Inc., 9
Federal Engineering Co., Inc., 70
Federal Fire Hose Mfg. Co., 87
Federal Sign & Signal Corp., 75
Federal Windows Mfg. Co., Inc., 93
Fee & Mason Mfg. Co., Inc., 5, 9
Fenwal, Inc., 99
Fiberglas Canada Ltd., 94
Film Plastics Corp., 94
Finnell System, Inc., 103, 105, 106
Fire Control Products, Inc., 69
Fire Devices, Inc., 77
Fire Devices, Ltd., 77

COPY PRINTE

MANUFACTURERS INDEX

Hewitt Rubber Div., Hewitt-Robins, Inc., 27
Hodgman Mfg. Co., 4, 6, 7, 11, 12, 13, 64, 66
Home Rubber Co., 27
Hooper, Wm. E. & Sons Co., 146
Horton Steel Works, Ltd., 39, 40, 42
Houghton, E. F. & Co., 96
Howe Electric Co., 12, 76
Hyster Co., 143, 144
Hythercamics, Inc., 4

Illinois Testing Laboratories, Inc., Ajax Instrument Co., Div., 112
Imperial Brass Mfg. Co., 85
Industrial Gas Engineering Co., Inc., 109
Industrial Timer Corp., 113
Ingersoll-Rand Co., Cameron Pump Div., 84, 96
Insto-Gas Corp., 101
Instruments, Inc., 80
International Chemical Extinguisher Corp., 50
International Fireproof Door Co., 78, 80
International Harvester Corp., 50
Ipsor Plastics, Inc., 84
Isaacs, David and Son, 40

Jamesbury Corp., 133, 141
Jenkins Bros., 17, 18, 19, 21, 27, 28
Jenkins Bros., Ltd., 17, 18, 20, 21, 28
Jorgensen Gage & Valve Co., 66
Johns-Manville Corp., 23
Johns-Manville Fibre Glass, Inc., 84
Johnson and Carlson, 40
Johnson Gear & Mfg. Co., Ltd., 97
Johnson-Williams, Inc., 106
Johnston & Jennings Co., Div. of Pettibone Mulliken Corp., 86
Johnston Pump Co., 34
Justrite Mfg. Co., 92, 93, 98, 146

Kaeco Hardware Corp., 100
Kearney & Mattison Co., 73
Kedzie Kane Alarm Co., 70
Kemlite Corp., 84
Kemp, C. M., Mfg. Co., The, 105, 106
Kennedy Valve Mfg. Co., The, 17, 18, 20, 24, 27, 28
Kidde Ultrasonic & Detection Alarms, Inc., Atmo Alarm Systems, 12, 67, 73, 75, 76
Kidde, Walter & Co., Inc., 43, 44, 45, 47, 48, 50, 52, 55, 56, 59, 60, 62
Kidde, Walter & Co. of Canada, Ltd., 47, 48, 50, 55, 56, 60
King Engineering Corp., 96
King-Knight Co., 86
Kinnear Mfg. Co., The, 79
Kober Mfg. Co., 9
Koppers Co., Inc., Wood Preserving Div., 84
Kuhns Brothers Co., 22
Kunkle Valve Co., 20
Kupferle, John C., Foundry Co., 24

Lacy Manufacturing Co., 39
Lancaster Malleable Casting Co., 10
Lasco Industries, 84
Latham Watchman's Clock Co., 142
Layne & Bowler Inc., 96
LeCourtenay Co., 24, 29
Leader Safety Products, 50
Lee Rubber & Tire Corp., Republic Rubber Div., 27
LeLacheur Corporation, The, 149
Levitt-Safety Ltd., Canadian distributor for Ansul Chemical Co., 43, 44, 48, 49, 57, 58
Lewis-Shepard Co., 145
Lexington Electric Products Co., Inc., 28
Linde Company, Div. Union Carbide Corp., 101, 102, 104, 105
Liquidometer Corp., 96
Lofstrand Co., The, 45
Lonergan, J. E., Co., 17, 29
Ludlow Valve Mfg. Co., Inc., The, 17, 18, 20, 24, 25
Lumenite Electronic Co., 89, 110
Lunkenheimer Co., The, 28
Lydon Brothers, Inc., 110

McAvity, T., & Sons, Ltd., 17, 18, 20, 24, 26
McCann-Sondeck Detective Agency, 70
McGinnis Marine Service, 50
McIntire, F. N., Brass Works, 21, 22
McLauthlin, George T., Co., 80
Magnatrol Valve Corp., 141
Mahon, R. C., Co., The, 79, 114
Manhattan Rubber Div., Raybestos-Manhattan Inc., 27
Manning, Maxwell & Moore, Inc., 89, 116
Manta Vin-Cor Steel Corp., 84
Marlboro Wire Goods Co., 7
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., 17, 122
Marshall Equipment Co., Inc., 27
Mason-Neilan Div. of Worthington Corp., 142
Mathieson, Olin, Chemical Corp., Ramset Fastening System, 10
Maxon Premix Burner Co., 130, 135, 137, 141
Mayer Tank Mfg. Co., Inc., 60
M & E Manufacturing Co., 93, 94
Merchant & Evans Co., 79
Merchants Police Signal and Alarm Co., 70
Mercoid Corp., The, 110, 112, 114, 134, 141
Metal Katcher Co., 146
M. & N. Valve & Fittings Co., 17, 18, 20, 24
Michigan Stoll Alarm Co., 76
Micromat Company, 101
Miller-Peerless Mfg. Co., 43, 47, 49, 58, 90
Miller Valve Company, Inc., 21
Mine Safety Appliances Co., 10, 106, 108, 150, 151
Mine Safety Appliances Co. of Canada, Ltd., 106, 150, 151
Minneapolis-Honeywell Regulator Co., 66, 72, 74, 76, 77, 110, 113, 118, 114, 120, 122, 127, 134, 142
Brown Instrument Div., 126, 139
Mission Valve & Pump Co., 21
Mitchell, John E., Co., 96
Monchi-Edwards Corrugating Co., The, 79
Monsanto Chemical Co., 96
Moon, John W., E. M. Clayton Co., Div., 20, 21
Moore, John B., Corp., 96
Moor-Flo Inc., 50
Morse Magneto Clock Co., The, 146
Morse Signal Devices, 69, 70
Morse Signal Devices of California, 70
Mosler Safe Co., The, 82
Mueller Co., 17, 18, 20, 24
Mutual Cylinder Gas Co., 101, 102, 104, 105
National Foam System, Inc., 47, 53, 54, 55, 62
National Lead Co., 9
National Tank and Manufacturing Co., Inc., 59
National-U. S. Radiator Corp., Div., Crane Co., 134
Newark District Telegraph Co., 70
New England Hardware Mfg. Co., 8
Niedner's, Charles, Sons Co., (Canada), 37
Niedner's, Charles, Sons Co., Inc., 37
Nooter Corp., 59, 60
Nordstrom Valve Div., Rockwell Mfg. Co., 117
North American Door Co., Inc., 79
North American Mfg. Co., 121, 127, 128
Notifier Corp., 12, 67, 69, 72, 74, 76, 77
Oberdorfer Foundries, Inc., 86
Ocean Div. of Pettibone Mulliken Corp., 86
Octagon Process Inc., 96
Ohio Injector Co., The, 17, 19
Omark Industries, 10
OPW Corp., 65
Orr & Sembower, Inc., 134
Otis Elevator Co., Inland Industrial Trucks Div., 143, 144, 145
Owl Protective Co., Inc., 70

Paasche Airbrush Co., 85, 94
Pacific Fire Extinguisher Co., 47, 55, 72
Pacific Fire Extinguisher Co., American Burglar Alarm Div., 70
Pacific Rolling Door Co., 79
Pacific Steel Boiler Div., Crane Co., 134
Packwood, G. H., Manufacturing Co., 96
Partlow Corp., The, 112, 113
Patterson-Kelley Co., The, 42
Paulin Co., Inc., The, 96
Peerless Pump Hydrodynamics Div., FMC Corp., 34, 35, 37
Penn Controls, Inc., Banco Div., 139
Pennsalt Co., 96
Perfection Products, 50
Peters, Jas. & Sons, 80
Petro, 134
Petrometer Corp., 85
Pettibone Mulliken Corp., Johnston & Jennings Co. Div., 86
Philipp Mfg. Co., 78, 80
Phillips Drill Co., 9
Phillips Petroleum Co., 96
Phister Mfg. Co., The, 56
Pioneer Fireproof Door Corp., 78, 80
Pioneer Mfg. Co., The, 96
Pioneer Works, H. K. Porter Co., Inc., Thermoid Div., 27
Pittsburgh-Des Moines Steel Co., 39, 40
Pneumercator Co., Inc., 86, 88
Polin Mfg. Co., Div. of Gregory Ind. Inc., 146
Porter, H. K. Co., Thermoid Div., 27
Potter Electric Signal Co., 12, 72, 73, 74
Powell, Wm., Co., The, 17
Power-Pak Products, Inc., 49, 50
Powhatan Brass & Iron Works, 27, 28, 30, 31, 32
Procter & Schwartz, Inc., 110

NTED CLOSE TO EDGE

MANUFACTURERS INDEX

Propellair Division of Robbins and Myers, Inc., 94
Protection Alarms, Inc., 13
Protection Controls, Inc., 133
Protection Engineering Corp., 72
Protectoseal Co., 43, 85, 86, 88, 89, 90, 92, 93, 145
Protectowire Co., 68, 72, 75, 77
Proximal Corp., 84
Pyrene Mfg. Co. of Canada, Ltd., 43, 44, 47, 55, 85, 86, 87, 92
Pyrenize, Inc., 115, 116, 127
Pyrotronics, a Div. of Baker Industries, Inc., 66

Rainier Corp., 4, 6, 7, 11, 12, 13
Ramset Fastening System, Winchester-Western Div., 10
Randolph Laboratories, Inc., 44, 46, 47, 48, 50, 52, 58, 59
Ransome Torch & Burner Co., 96
Rawlplug Co., Inc., The, 9
Raybestos-Manhattan, Inc., Manhattan Rubber Div., 27
Raymond Corp., 145
Reavo Electrical Co., Inc., 75, 76
Reliable Automatic Sprinkler Co., Inc., The, 4, 6, 7, 11, 12, 13, 64
Remington Arms Co., Inc., 19
Republic Rubber Div., Lee Rubber & Tire Corp., 27
Research Products Corp., 94
Resolite Corp., 84
Retlaw Eng. & Mfg. Co., 116
Revere, Inc., 101, 106
Rhode Island Electric Protective Co., 72
Richards-Wilcox Mfg. Co., Inc., 70, 80, 82
Richmond Fireproof Door Co., Inc., The, 78, 79, 80
Ripolite Plastic Products Inc., 84
Robbins and Myers, Inc., Propellair Division, 94
Robertson, H. H., Co., 84
Robinson Electronic Supervisory Co., 72
Rochester Mfg. Co., 145
Rockwell Mfg. Co., Nordstrom Valve Div., 117
Rockwell, W., S., Co., 109, 110
Rockwood Sprinkler Co., 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 20, 22, 23, 55, 63, 64, 65, 66
Roddis Plywood Corp., 72
Rosenwach Tank Co., Inc., 46
Ross, J. G., Engineering Corp., 109
Roth, Ernest, & Sons, 46
R-P&C Valve Div., American Chain & Cable Co., Inc., 17, 18, 20
Ruggles-Klingemann Mfg. Co., 131, 137
Rund Mfg. Co., 42

Safety Fire Extinguisher Co., The, 47, 49, 53
Safety First Products Corp., 44, 47, 50
Safety Gage Co., 96
Safety Supply Co., 85, 86, 88, 89, 90, 92, 93, 96, 106, 146, 150, 151
Saino, F. L., Mfg. Co., 76, 79, 80
St. Louis Fire Door Co., 78, 79, 80
Sandman Electric Co., Inc., G & M Engineering Co. Div., 26
Sanson, Henry E., and Sons, Inc., 94
Sargent Building Specialties, Inc., 84
Schoenberger, W. J., Co., 117
Schwartz Brothers, Inc., 44, 47, 49, 50, 53
Scott Aviation Corp., Safety Equipment Division, 151
Sears, Roebuck and Co., 48, 47, 49, 50, 55, 104
Sees Manufacturing, Inc., 11, 22, 23, 43, 44, 46, 47, 49, 50, 53
Security Fire Door Co., 80
Selas Corp. of America, 105, 106
Sentinel Alarm Corp., 72
Shand & Jurs Co., 96
Shell Oil Company, 96
Shipp Inc., 10
Simco Company, The, 109
Simplex Door Co., 80
Simplex Time Recorder Co., 106
Smith, D. S. & Co., Inc., 45
Smith Detective Agency & Nightwatch Service, Inc., 72
Smith, H. B. Co., 42
Snyder, M. L. & Son, 47, 53
Stempel Fire Extinguisher Mfg. Co. Div., 27, 44, 46, 47, 49, 50, 53
Snyder, M. L. & Son Ltd. (Canada), 47, 53
Socony Mobil Oil Co., Inc., 96
Spray Engineering Co., 65, 92, 94
Spraying Systems Co., 7, 92, 93, 96
Sperling Fire Alarm and Indicator Co., Inc., 66, 68, 72, 77
Square D Co., 118, 146
Standard Fire Hose Co., 20
Star Expansion Industries Corp., 9
Star Sprinkler Corp., 4, 6, 7, 11, 12, 13, 14, 16, 20, 64, 66
Stearns, A. T., Lumber Co. The, 45
Stempel Fire Extinguisher Mfg. Co., (see Snyder, M. L. & Son)
Stevens Linen Associates, 27
Stobbe, H. M., Co., 149
Stockham Valves & Fittings, 17, 18, 20
Stop-Fire, Inc., 44, 45, 47, 49, 50, 53, 56
Stromberg Div. of General Time Corp., 77
Structoplex, Inc., 84
Superior Automatic Sprinkler Co., Inc., 4
Superior Fireproof Door & Sash Co., Inc., 80
Surface Combustion Corp., 109
Sweeney, S. K., Mfg. Co., 149
Synchro-Start Products, Inc., 26

Taft Corporation, The, 149
Taylor Iron Works & Supply Co., 59, 60
Thermoid Div., H. K. Porter Co., Inc., 27
Thibault, Pierre, Canada Ltee, 84
Thor Power Tool Co., Drying System Co., Div., 109, 113, 114, 127
Tobleflex Corp., 96
Towmotor Corp., 143, 144
Traverse City Iron Works, 15, 20, 21, 24

Union Carbide Corp., Linde Div., 101, 105, 106, 108
Union Carbide Chemicals Co., Div., 96
United Electric Controls Co., 13, 112
United Specialties, Inc., 105
U. S. Expansion Bolt Co., 9
United States Gauge, Division of American Machine & Metals, Inc., 17
United States Hoffman Machinery Corp., 109
United States Pipe and Foundry Co., 89
U. S. Plywood Corp., Door Division, 72, 84
United States Rubber Co., 27, 29
Universal Fire Hose Mfg. Co., Inc., 21

Valve, Inc., 69
Van Leer Industries, 85
Vapor Recovery Systems Co., The, 86
Velocity Power Tool Co., The, 13
Victaulic Co. of America, 21
Viking Corp., The, 4, 6, 7, 11, 12, 13, 14, 16, 21, 64, 66
Vogel, H. G., Co., 4, 96

Wallace & Tiernan, Ltd., 69
Walnut Hill District Telegraph Co., 72
Walworth Co., Inc., 15, 17, 19
Warren Pump Co., Inc., 84
Watkins Engineering Co., 109
Waukesha Motor Co., 26
Weber & Treuth Co., 69
Webster Electric Co., 26
Wendnagel & Co., Inc., 69
Wenzels Tank Co., 46
Western Products, Inc., 151, 157
Westfield Sheet Metal Works, Inc., 95
Westinghouse Electric Corp., 61, 109, 146
Wheaton Instruments (see Rodney Colman Co.)
Wheeler, C. H. Mfg. Co., Rotary Pumps Division, 94
Williams, D. T., Valves, 59, 157
Williams Gauge Co., Inc., The, 17
Wilson Products, Inc., 132
Wilson & Cousins, Ltd., 69, 71
Wilson, J. G., Corp., The, 79
Winston Company, 59
Wirt & Knox Mfg. Co., 58, 67
Witt Cornice Co., The, 145
Wood Products Div., Weyerhaeuser Co., 72
Worthington Corp., 54, 58, 59
Mason-Neilan Div., 103

Yale & Towne Mfg. Co., The, 143, 144, 145
Yankee Metal Products Corp., 85
Yates, J. W., 92

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EQUIPMENT INDEX

Corrosion prevention, gravity tanks, 46
Couplings, flexible, 92
  hose, 50
Covers, fire-resistive fabrics, 142
  waterproof, 146
Cupola safeguards, 117
Cutting and welding equipment, acetylene, 101

Deluge systems, 13
Detection devices, fire, 75
Detectors, gas, 106
Dip tanks, 92
Direct-connection fill units, 86
Disconnect switches, 146
Discs for steam pump valves, 37
Disposal cans, 90
Door-closing devices, heat-actuated, 82
Door latches, oven, 109
Doors, fire, 75
  vault, 87
Drain, drip, disposal cans, 90
Driers, water-spray protection, 66
Drivers for fire pumps, 36
Drives, right-angle gear, 36
Drum pumps for flammable liquids, 86
Dry-chemical, extinguishers, general-purpose type, 59
  regular type, 49
Dry-chemical extinguishing systems, 60
Dry-compound extinguishers, 57
  powders, 56
Dry pendant automatic sprinklers, 6
Dry-pipe systems, protection, 14
  air pressure maintenance devices, 13
  valves, 13
    accelerators and exhaustors for, 13

Electric-interlock cocks, 117
Electrostatic neutralizers, 140
Elevator doors, 80
Emergency shutoff valves, 80
Exhaustors for dry-pipe valves, 13
Exhaust fans, kitchen, 94
Expansion shields, 5
Explosion-venting hatches for oven doors, 109
Explosion-venting windows, 82
Explosive-driven fasteners, 10
Extinguishers, 48
  air-foam equipment, 54
    for alcohols, 55
  antifreeze, 46
  carbon dioxide, 47
  chemical-foam, 52
  chemical-foam generators, 52
  chemical-foam powder for alcohols, 54
  dry-chemical, general-purpose type, 59
    regular type, 49
  dry-compound, 56, 57
  fire pails, 48
  foam, 50
  pump tanks, 43
  soda-acid, 46
  stored-pressure, water-filled, 45
  vaporizing-liquid, 58
  water-filled, 44
  wet-spray nozzles, 51
Extinguishing systems, carbon dioxide, 60
  dry-chemical, 60
  foam, 69
  water-spray, 64

Fabrics, fire-resistive, 142
Fans, spray booth, 94
Fasteners, explosive-driven, 10
Faucets, self-closing, 90
Fill and vent fittings for tanks, 86
Fill units, direct connection, 86
Filling and supply cans, 90
Finishing materials, 97
Fire alarms (see Signaling systems)
Fire-department connections, 21
Fire-detection devices, 75
Fire doors, 75
  closing devices, 82
  fusible links, 80
  hardware, 80
  vault, 87
Fire extinguishers (see Extinguishers)
Fire hose (see Hose)
Fire pails, 48
Fire pumps, 33
  controllers, 37
  drivers, 36
Fire-resistive fabrics, 142
Fire-retardant protected metal sheets, 84
Fire-retardant plastic panels, 84
Fire-retardant treated lumber, 84
Fire-service mains, 21
Flame arresters, for carburetor air intakes, 86
  for gas piping systems, 105
  hydraulic, 105
  for industrial trucks, 86
  for storage-tank vent pipes, 86
Flame-reflection-frequency-actuated fire-alarm systems, 68
Flammable-gas equipment, 90
Flammable-liquid equipment, 85
Flammable liquids, drum pumps for, 88
  mixers for, 90
  safety containers for, 90
  water-spray protection for, 64
Flexible couplings, 92
Flow-check valves, 116
Flush-type automatic sprinklers, 4
Flowers, gas, welding, 100
FM safety cocks, 116
Foam extinguishers, 52
Foam-extinguishing systems, 69
Foam generators, 68
Foot valves, 30
Forges, portable, 94
Fuel and combustion controls, 100
Fuel gas cocks, 116, 117
Fuel gas, mixing equipment, 100
Fuel gas valves, 136
Fuel oil cocks, 117
Fuel oil valves, 130
  antisiphon, 116
Fuse cab, flame-arresting, 85
Furnace heaters, external, 100
Furnaces, portable, 101
Fusible links, 80

Gages, liquid level, 86, 91
  mercury, 43
  pressure, 16
Gas/airflow check valves, 116
Gas-analysis and alarm equipment, 106
  indicators, detectors, 106
Gas-analyzing safeguards for gas burners, 139
Gas burners, combustion safeguards, 116, 125, 127, 139
Gas cartridge, water-filled extinguishers, 44
Gas cocks, FM safety-control, 116, 117
  electric-interlock, 117
Gas cutting and welding, 101
Gas fixtures, 106
Gas masks, 149
Gas mixers, 100
Gas safety cocks, 116, 117
Gas or air shutoff valves, 136
Gases, hazardous, equipment for handling, 101
Gate valves, 17
Generators, acetylene, 101
  foam, 68
Gravity tanks (see Tanks)
Guards, sprinkler, 7

Hangers, sprinkler, 7
  concrete inserts, 9
  expansion shields, 5
  explosive-driven fasteners, 10
Hazardous atmosphere, switches for, 146
Heat-actuated, door-closing devices, 82
Heat-actuated fire-alarm systems, 67
Heat-actuated releases, 16
  (see also Fire detection devices, 75
  Fusible links, 80)
Heaters, external, for ovens and furnaces, 100
  for gravity tanks, 46, 48
High-temperature limit switches, 112
Horizontal driers, protection for, 66
Horns, 76
Hose, 24
  cabinets, 26
  couplings, 26
  houses, 26
  menders, 31
  nozzles, 31, 32
  playpipes, 26
  racks, 26
  reels, 26, 106
  stations, 26
  valves, 24
Hose masks, 149
Hydrant hose valves, 27
Hydrants, 24, 27
Hydraulic flame-arresters, 105
Hydraulic fluids, 96
Hydrostatic-test pumps, 97

Indicator posts, 19
Indicators, combustible gas, 106
  waterflow, 11
Industrial trucks, 140
Inside-screw gate valves, 18
Interlock cocks for gas or oil, 117
Intrinsically safe switches, 148

Joints, pipe, 23

Kitchen exhaust fans, 94

Large-orifice automatic sprinklers, 4
Latches, explosion-venting for oven doors, 109
Level-limit switches, 89
Limited-service fire pumps, 34
  controllers for, 38
Limited water supply, constant-pressure tanks, 42
Linen fire hose, 27
Liquid-tight switch enclosures, 148
Liquefied petroleum gas, relief valves, 100
  systems, 96
  torches, furnaces, 101
  vaporizer-mixers, 100
  vaporizers, 98
Liquid-level gages, 86

TED CLOSE TO EDGE

EQUIPMENT INDEX

Liquids mixers, 89
Local-application CO_2 systems, 58
Local signaling systems, 67
Lumber, treated fire-retardant, 84

Magnetic separators, 148
Manifolds, oxy-acetylene, 104
Manual fire-alarm systems, 65
Masks, gas, smoke, 149
Mechanical joint for piping, anchorage for, 28
Menders, fire-hose, 31
Mercury gages, 42
Meters, fire service, 21
  static, 149
Mixers, flammable liquids, 89
  gas, 103
  L.P-gas, 100
Monitor nozzles, 32

Neutralizers, electrostatic, 149
Nozzles, hose, 31
  monitor, 32
  water-spray, 32

Oil burners, combustion safeguards for, 118, 127
Oil cocks, electric-interlock, 117
Oil valves, 120
Oily waste and refuse cans, 146
Open sprinklers, 6
Outside-screw gate valves, 17
Oven door latches, explosion-venting, 109
Oven heaters, external, 109
Overspray collectors, 94
Oxy-acetylene equipment, 101
Oxygen-line filters, 104

Paint, fire, 83
Paint spray-finishing equipment, 91
Paint vehicles, 97
Pendent automatic sprinklers, 3
Pipe, collars, 11
  fittings, 28
  joints, 28
Plastic panels, fire-retardant, 84
Playpipes, 31
Plunger cans, 92
Proaction sprinkler systems, 14
Pressure gages, 18
Pressure-relief valves, 100
Pressure-supervisory switches, 116, 119
Proprietary signaling systems, 72
Protected-metal sheets, 84
Pump-suction tanks, 38
Pump tanks, 45
Pumps, drum, flammable liquids, 93
  fire, 33
    controllers, 37
    drivers, 36
  hydrostatic test, 37

Quick-closing valves, 89

Radioactive-type alarm systems, 65
Rate-of-rise sprinkler systems, 13
Reels, fire hose, 30
  gas hose, 106
Refuse cans, 146
Regulators, cutting and welding, 103
Releases, automatic, 16
  (see also Fire Detection Devices, 78, Fusible Links, 83)
Relief valves, general service, 101
  L.P-gas, 100
  water, 39
Remote-control hose valves, 30
Remote-station alarm systems, 72
Right-angle gear drives, 36
Rotation interlocking switches, 116

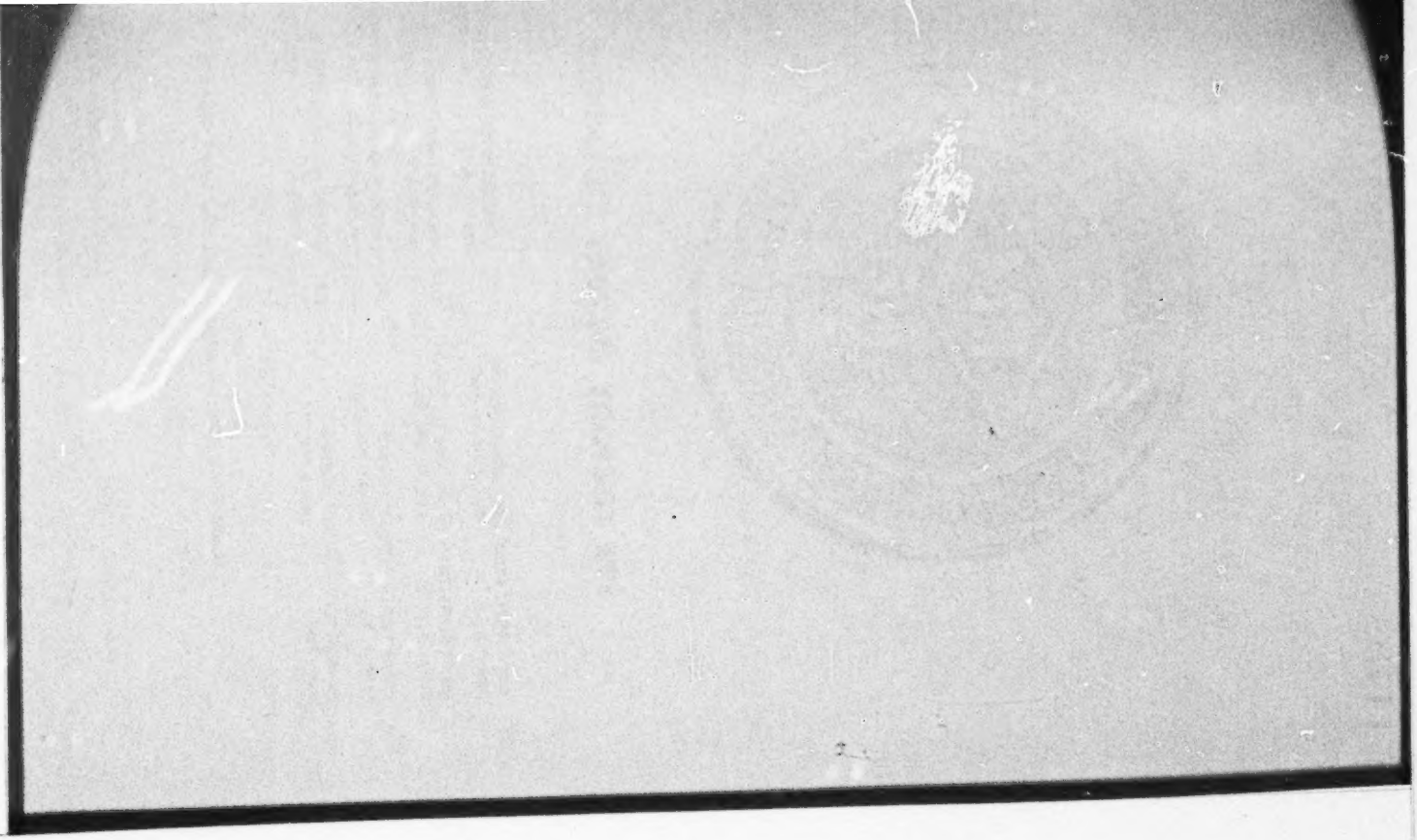
Safes, 82
Safety bungs, 88
Safety cocks, FM, 116
Safety containers for flammable liquids, 90
Safety shutoff valves, gas, 126
  oil, 120
Safety solvents, 96
Safety switches, 148
Safety tools, 94
Scuppers, 83
Self-closing faucets, 88
Separators, magnetic, 148
Sidewall automatic sprinklers, 4
Signaling systems, electric, 67
  central station, 69
  equipment, 73
    fire detection devices, 76
    signals, 78
  fire alarm, automatic, 67
    flame-radiation-frequency actuated, 68
    heat-actuated, 67
    manual, 65
    smoke-actuated, 68
  proprietary, 72
  remote-station, 72
  sprinkler-supervisory, 69
  watchman-supervisory, 69
  waterflow, 69
Sleeves for sprinkler pipes, 11
Smoke-actuated fire-alarm systems, 68
Soda-acid extinguishers, 46
Solvents, safety, 96
Spray booths, 93, 94
Spray-finishing equipment, 92, 94
Spray nozzles, 31, 64
Sprinkler guards, 7
Sprinkler deluge systems, 13
Sprinkler hangers, 7
  inserts, 9
Sprinkler pipe fittings, 28
  branch line testers, 11
Sprinkler protection, 3
Sprinkler-supervisory systems, 69
Sprinkler tanks (see Tanks)
Sprinkler systems, automatic, 3
  deluge, 13
  proaction, 14
Sprinklers, automatic, 3
  cornice, 6
  dry pendent, 6
  flush-type, 4
  large-orifice, 4
  open, 6
  pendent, 3
  sidewall, 4
  standard, 3
  upright, 3
  window, 6
Standardized mechanical joints, 28
Static meters, 149
Static neutralizers/collectors, 149
Station valves, 104
Steam fire pumps, rubber discs for, 37
Straightway hose valves, 28
Strainers for water-spray extinguishing systems, 60
Supervisory-alarm systems, 69
Swabbing cans, 92
Switch enclosures, lintight, 149
Switches, airflow interlocking, 114
  disconnect, 145
  for hazardous atmospheres, 148
  level limit, 89
  pressure, supervisory, 116
  rotation interlocking, 116
  safety, 148
  temperature-limit, 112
  temperature-supervisory, 112
  time-delay, 119
  waterflow alarm, 12

Tanks, cleaning and dipping, 92
  flammable liquids, fittings and vents for, 88
  gravity, 39
    corrosion prevention, 40
    heaters for, 40, 42
  limited water supply, constant-pressure, 42
  pump, 43
  pump suction, 38
Temperature-limit switches, 112
Temperature-supervisory switches, 112
Time-delay switches, 119
Tire spray machines, 93
Tools, safety, 94
Torches, cutting, 102
  portable, 94, 101
Total flood CO_2 systems, 58
Transformer, water-spray protection, 64
Trucks, industrial, 149

Upright automatic sprinklers, 3

Valves, alarm, 11
  angle, hose, 27
  antisiphon, fuel-oil, 116
  ball, 20
  check, 20
    antiwater hammer, 21
    bronze, special, 21
    cupola knob-pressure, 127
    foot, 19
    gas/air flow, 126
    water-flow detector, 21
  dry-pipe, 13
  emergency shutoff valve, 9
  flow-check, gas or air, 114
  fuel-oil, 120
  gas, 126
  gate, 17
  hose, 27
  hydrant, hose, 24
  hydrants, 24
  indicator posts, 19
  inside-screw, gate, 16
  outside-screw, gate, 17
  pressure-relief, 100
  quick-closing, 89
  relief, general service, 101
    L.P-gas, 100
  remote-control, hose valves, 30
  safety shutoff, gas, 126
    oil, 120
  station, 104
  straightway, hose, 28
  water-control, 16
  waterflow alarm, 11
  waterflow detector, check, 1
  water-relief, 39
Vaporizers, L.P-gas, 99
Vaporizing-liquid extinguishers
Vault doors, 82
Vent fittings and pipe-flame arrester, 36
Ventilating fans, spray booths
Vents, cupola window, 11
  flammable liquids tanks, 88

Wall cabinets for hose, 28
Wall scuppers, 83
Wash tanks, 92
Waste cans, 146
Watchman's clocks, 146
Watchman's supervisory fire-alarm systems, 69
Water-control valves, automatic
Water-filled extinguishers, 44
Waterflow alarms, 69
  indicators, 11
  switches, 12
  valves, 11
    detector check valves, 21
Water-relief valves, 39
Water-spray, extinguishing systems, 64
  nozzles, 32
  strainers, 66
Water supplies, limited, constant-pressure tanks, 42
Water-wash spray booths, 93
Waterproof covers, 146
Welding equipment, 101
Window sprinklers, 6
Windows, metal, frames and sash, 83
  explosion-venting, 82
Woven-jacket rubber-lined hose



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